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THERMOPHYSICAL PROPERTIES DATA FOR OXYGEN
TO HIGH PRESSURES (5000 TO 10,000 psia)
AT LOW TEMPERATURES (National Bureau of
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EXTRAPOLATION OF THERMOPHYSICAL PROPERTIES DATA

FOR OXYGEN TO HIGH PRESSURES (5,000 TO 10,000 PSIA)

AT LOW TEMPERATURES (100-600°R)

by

L. A. Weber



U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

Institute for Basic Standards
Boulder, Colorado 80302

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EXTRAPOLATION OF THERMOPHYSICAL PROPERTIES DATA
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AT LOW TEMPERATURES (100-600°R)

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U.S. DEPARTMENT OF COMMERCE
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EXTRAPOLATION OF THERMOPHYSICAL PROPERTIES DATA
FOR OXYGEN TO HIGH PRESSURES (5,000 TO 10,000 PSIA)
AT LOW TEMPERATURES (100-600°R) *

L. A. Weber

Thermophysical properties data for oxygen at pressures below 5000 psia have been extrapolated to higher pressures (5,000-10,000 psia) in the temperature range 100-600°R. The tables include density, entropy, enthalpy, internal energy, speed of sound, specific heat, thermal conductivity, viscosity, thermal diffusivity, Prandtl number, dielectric constant, $(\partial P/\partial V)_T$, $(\partial P/\partial T)_V$, $V(\partial H/\partial V)_P$, $V(\partial P/\partial U)_V$, $-V(\partial P/\partial V)_T$, $V^{-1}(\partial V/\partial T)_P$.

Key words: Density; dielectric constant; enthalpy; entropy; equation of state; Prandtl number; oxygen; specific heat; speed of sound; thermal conductivity; thermal diffusivity; viscosity; volume.

1. Introduction

Densities, thermodynamic and transport properties of gaseous and liquid oxygen at pressures to 5,000 psia have been given by Weber [1] and McCarty and Weber [2] for temperatures from 100 to 600°R. Recent developments in the design of spacecraft engines, however, have resulted in the need for thermophysical properties data at higher pressures. Extrapolations of the above calculations are presented here in an attempt to satisfy these requirements.

2. Methods of Calculation

The PVT surface has been broken into two regions. For densities greater than 65.9 lb/ft³ an extrapolation of the empirical liquid equation of state surface [1] is used. This surface has the form,

* This work was carried out at the National Bureau of Standards under the sponsorship of the National Aeronautics and Space Administration - Order No. W-13,353, Office of Advanced Research and Technology, NASA Headquarters, Washington, D. C.

$$P = RT\rho + (A_1 + A_2T + A_3T^2) + (A_4 + A_5T + A_6T^2 + A_7T^3)\rho + (A_8 + A_9T + A_{10}T^2)\rho^2 + (A_{11} + A_{12}T)\rho^3 \quad (1)$$

with the values of the coefficients given in reference [1]. This surface covers the region from the melting curve to about 230°R at 5000 psia and to about 270°R at 10,000 psia, shown as region A in figure 1.

For densities less than 65.9 lb/ft³ the surface was represented with a set of closely spaced isochore polynomials generated from the original data. These isochore polynomials were of the form,

$$P = \sum_{J=1}^N A_J T^{(3-2J)} \quad (2)$$

with N varying from 4 at the highest densities to 6 at the lowest. A total of 40 isochore polynomials are used. This region is labeled B in figure 1.

Densities are obtained from an input of pressure and temperature by iteration. Once the densities have been obtained, the thermodynamic properties are calculated by the methods given in detail in reference [1]. The methods used to obtain the dielectric constant, transport, and related properties are given in reference [2]. The results are given in Table 1.

3. Estimate of Uncertainties

These extrapolations are based on one set of self consistent measurements which covers the range of pressure up to 5000 psia and temperature up to 540°R. Beyond this range no reliable data exist at present. As a result, the reliability of the calculated properties in Table 1 is difficult to estimate. A careful analysis of the tables and of the relationships used to obtain them can, however, lead to some useful guidelines.

From the data and comparisons in [1] we have estimated the uncertainties reasonably well at pressures below 5000 psia. The remaining task is the estimation of the increase in the uncertainties due to the extrapolation from 5000 to 10,000 psia. Here it is well to note that these latter uncertainties depend most importantly on the density range of the extrapolation rather than the pressure change, and thus depend on the temperature. For example, at 120°R an increase in the pressure from 5000 to 10,000 psia results in a density increase of only 2.6%, while at 540°R the same change increases the density by about 52%.

In the region of the surface represented by the multiple isochore polynomials the tabulated derived properties are not mathematically smooth but exhibit a certain amount of roughness due to the fact that each polynomial is independent of the others. In addition the entries for 5000 psia in Table 1 are not identical to those in [2] due to small differences in the method of calculation. We may use this roughness and differences to estimate the minimum uncertainties.

The relationships used to obtain the tables allow us to calculate the effects on the derived properties of uncertainties in the P-V-T surface. For example, we may examine the relationship used to obtain enthalpy changes along an isotherm,

$$H(T, \rho_2) = H(T, \rho_1) + \frac{P(T, \rho_2)}{\rho_2} - \frac{P(T, \rho_1)}{\rho_1} + \int_{\rho_1}^{\rho_2} \left[P - T \left(\frac{\partial P}{\partial T} \right)_\rho \right] d\rho / \rho^2. \quad (3)$$

The error in enthalpy will depend upon the errors in the density, ρ , and the isochore derivative, $(\partial P / \partial T)_\rho$. The importance of the density change, $(\rho_2 - \rho_1)$, is obvious.

The uncertainty in density is estimated as 0.2% in this range. Errors in the isochore derivatives $(\partial P/\partial T)_\rho$ and the isotherm derivatives, $(\partial P/\partial \rho)_T$, are of the order 1-2% and 5-10% respectively. From the above considerations, uncertainty estimates for enthalpy are given in Table 2,

Table 2. Uncertainty estimates for enthalpy, in BTU/lb.

P (psia)	T (° R)	120	540
5,000		±0.10	0.27
10,000		0.13	0.38

and those for entropy are given in Table 3.

Table 3. Uncertainty estimates for entropy, in BTU/lb-° R

P (psia)	T (° R)	120	540
5,000		±0.0005	0.0007
10,000		0.0007	0.0015

Uncertainty in C_p is about 3-5% at 5000 psi and it should be about the same at 10,000 psi since C_p changes slowly with pressure in this pressure range. The precision of the tabulated values is about 3%. The heat capacity at constant volume may be in error by 1-2%. Uncertainties in the sound velocity, dielectric constant, thermal conductivity, and viscosity are about 3-5%, 0.01%, 5-8%, and 10-15% respectively.

From these the uncertainties in the remaining quantities are calculated from the relationships in reference [2] and are given in Table 4.

Table 4. Uncertainty estimates in the derived properties.

$v\left(\frac{\partial H}{\partial V}\right)_P$	7-10%
$v\left(\frac{\partial P}{\partial U}\right)_V$	2-3%
$-v\left(\frac{\partial P}{\partial V}\right)_T$	5-10%
$-\frac{1}{V}\left(\frac{\partial V}{\partial T}\right)_P$	5-10%
Thermal Diffusivity	6-8%
Prandtl Number	12-17%

In general the larger uncertainties apply to the higher temperatures.

The only experimental data available for comparison in this pressure range are the isothermal compressibilities on two isotherms in the compressed liquid, at 77.35 and 90.07 K, measured by Van Itterbeek and Verbeke [3]. From the comparison in figure 2, it is obvious that their data deviate systematically from that of reference [1] on which this report is based. However, the lines, drawn through the points at low pressures, where the data of [1] exist, indicate that the extrapolation probably does not add more than about 0.1% to the uncertainty of the experimental data of [1].

Figures 3 and 4 compare the densities and enthalpies of these calculations with properties calculated via the Goodwin equation of state [4] fitted to the same data. The enthalpies were adjusted to the same values at 100 atm. The agreement between the two extrapolations is very good except near room temperature. Figures 5 through 9 illustrate the behavior of some of the properties in the extrapolated region.

4. References

1. Weber, L. A., J. Res. National Bureau of Standards 74A, No. 1 (Jan-Feb 1970).
2. McCarty, R. D. and Weber, L. A., NBS Tech. Note 384 (1971).
3. Van Itterbeek, A. and Verbeke, O., Cryogenics 2, 79 (1971).
4. Goodwin, R. D., Submitted to J. Res. National Bureau of Standards.

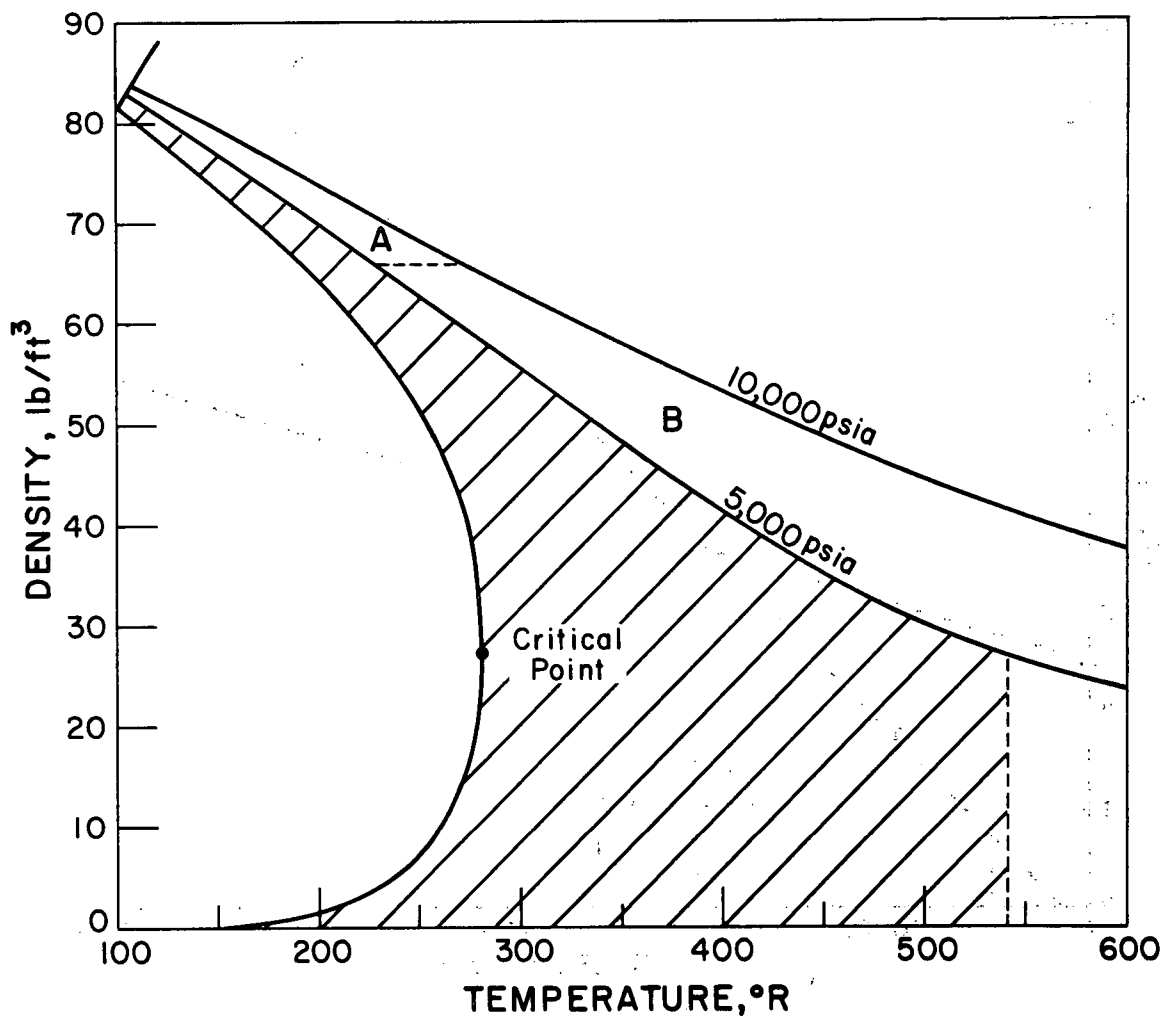


Figure 1. Phase diagram for oxygen showing the region of data (shaded) and the region of extrapolation; area A uses an equation of state surface representation, area B uses isochore polynomial representations.

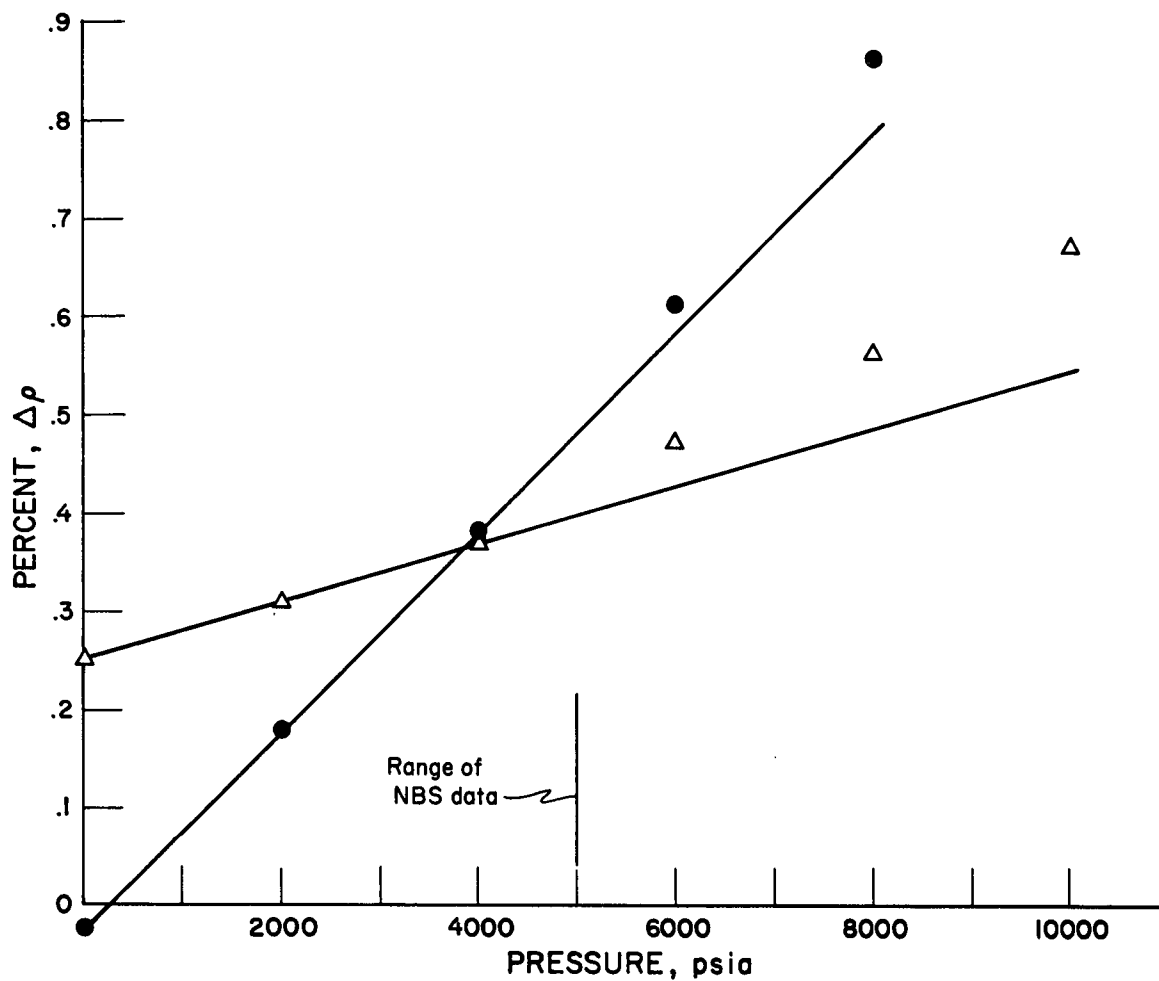


Figure 2. Comparison of densities derived from NBS data [1] with those of Van Itterbeek and Verbeke [3]. Δ - 77.35 K
 ● - 90.07 K.

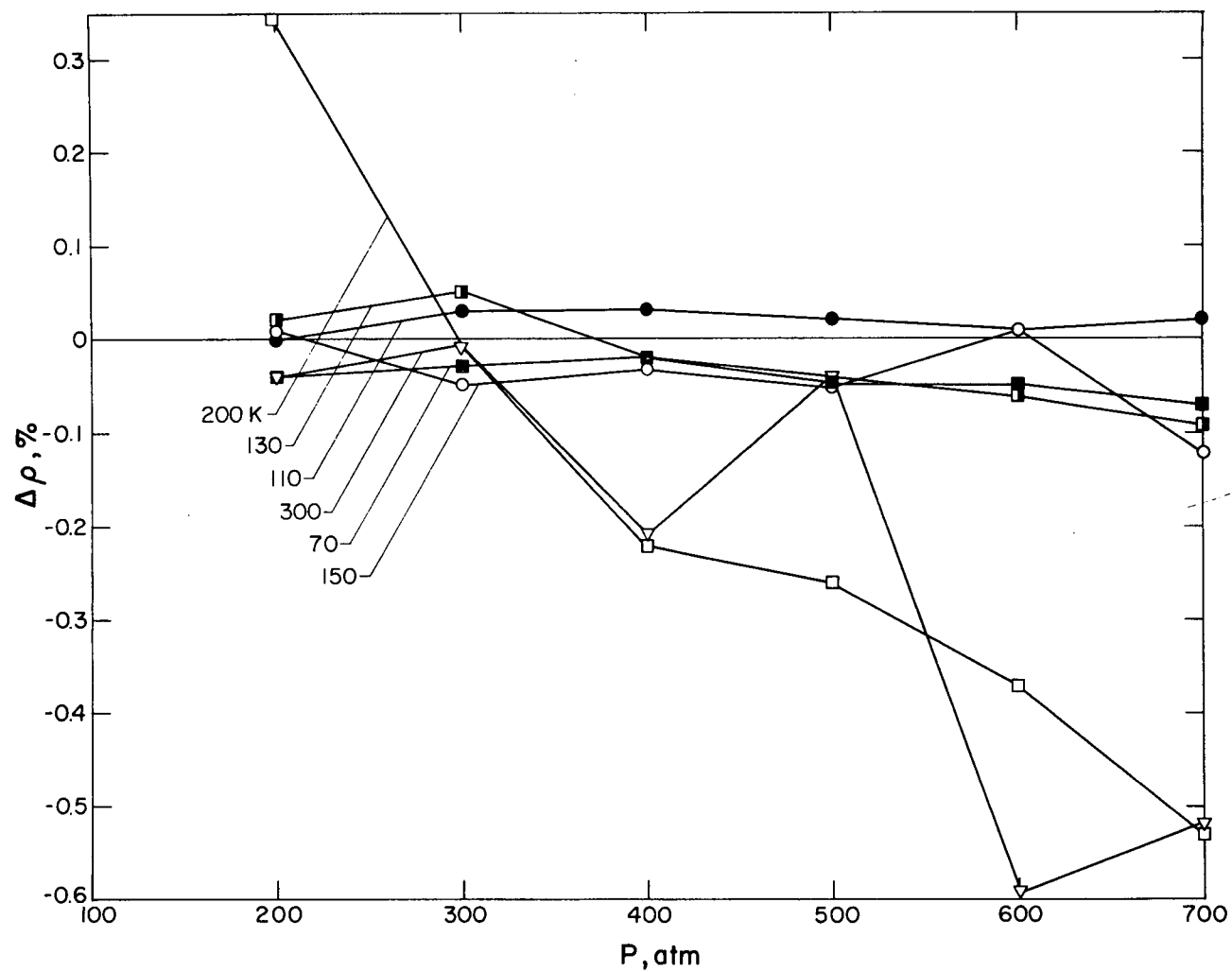


Figure 3. Comparison of densities calculated here with those calculated via the Goodwin equation of state [4].

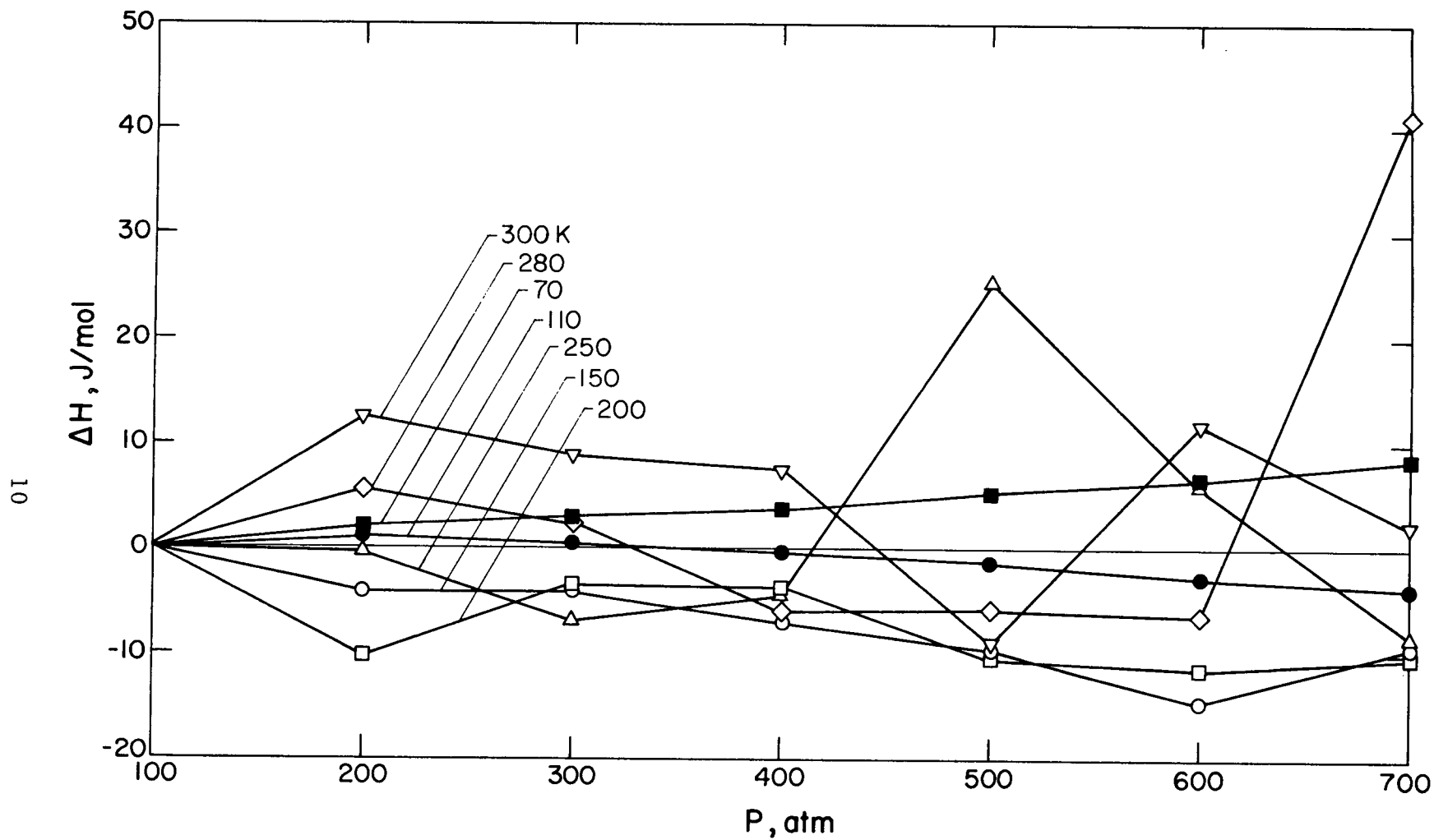


Figure 4. Comparison of enthalpies calculated here with those calculated via the Goodwin equation of state [4] (adjusted to the same values at 100 atm; 1 J/mol = 0.013 BTU/lb).

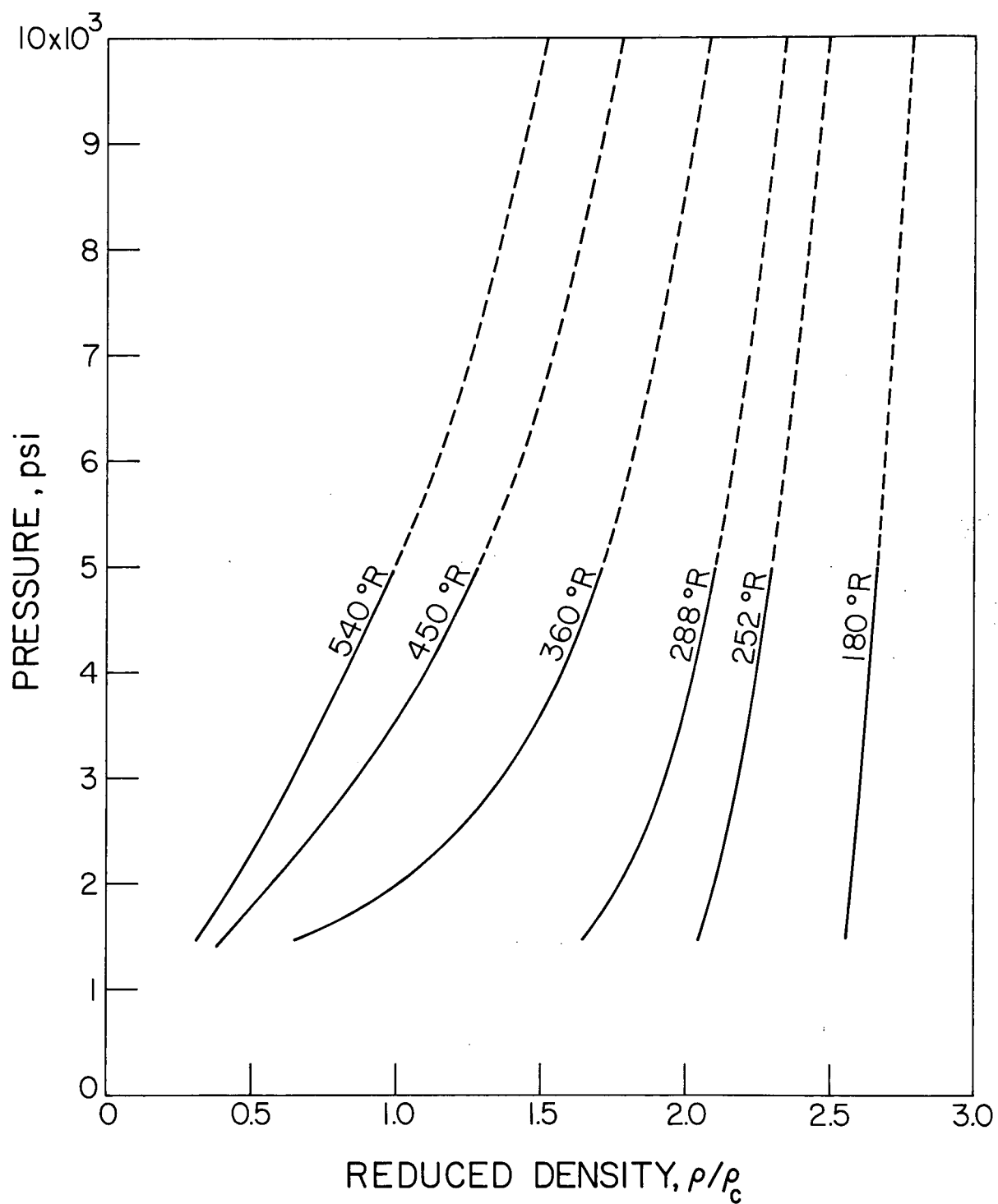


Figure 5. Pressure as a function of density of oxygen showing range of extrapolation (dashed curves).

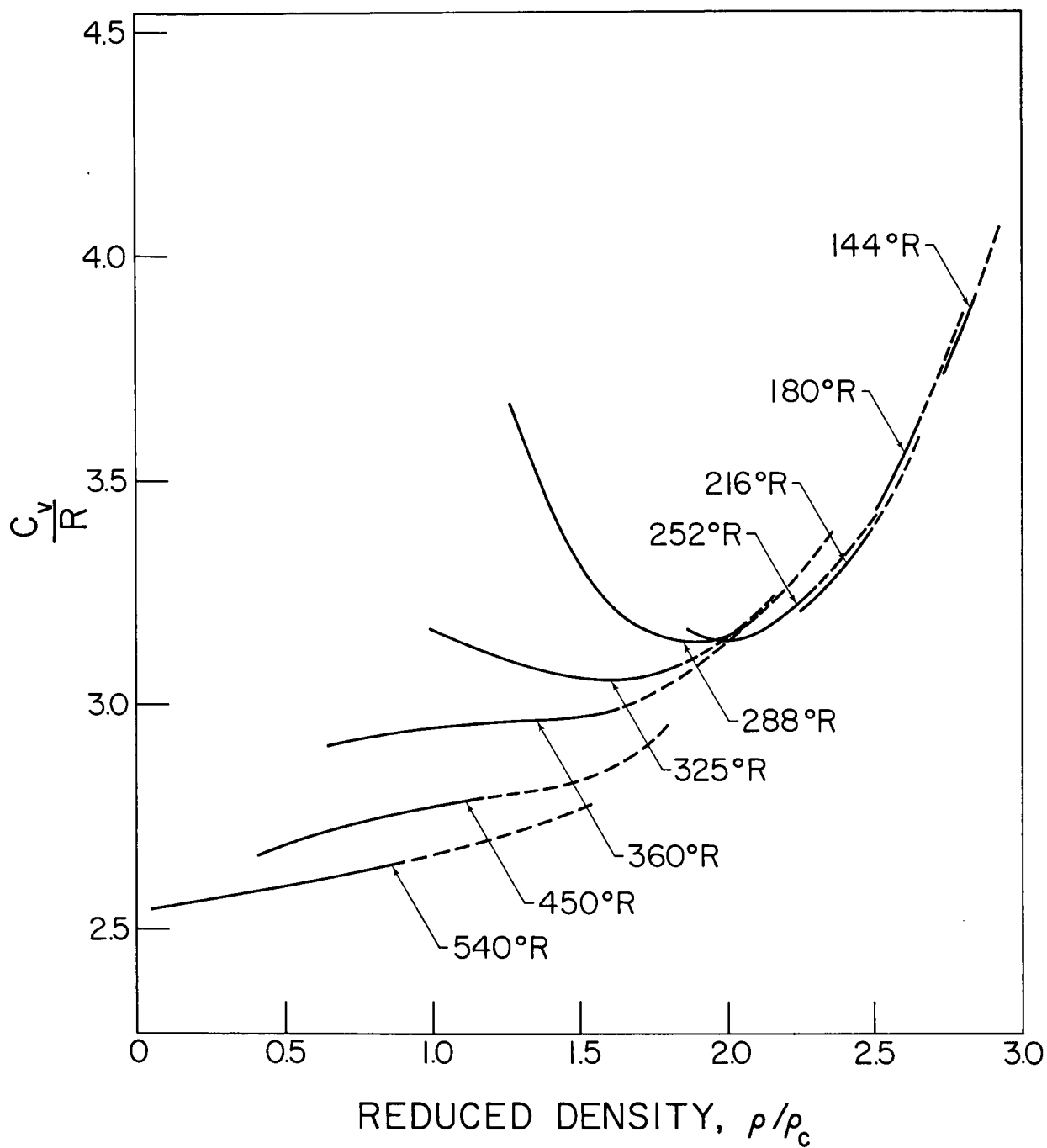


Figure 6. Heat capacity of oxygen at constant volume; dashed curves are extrapolations.

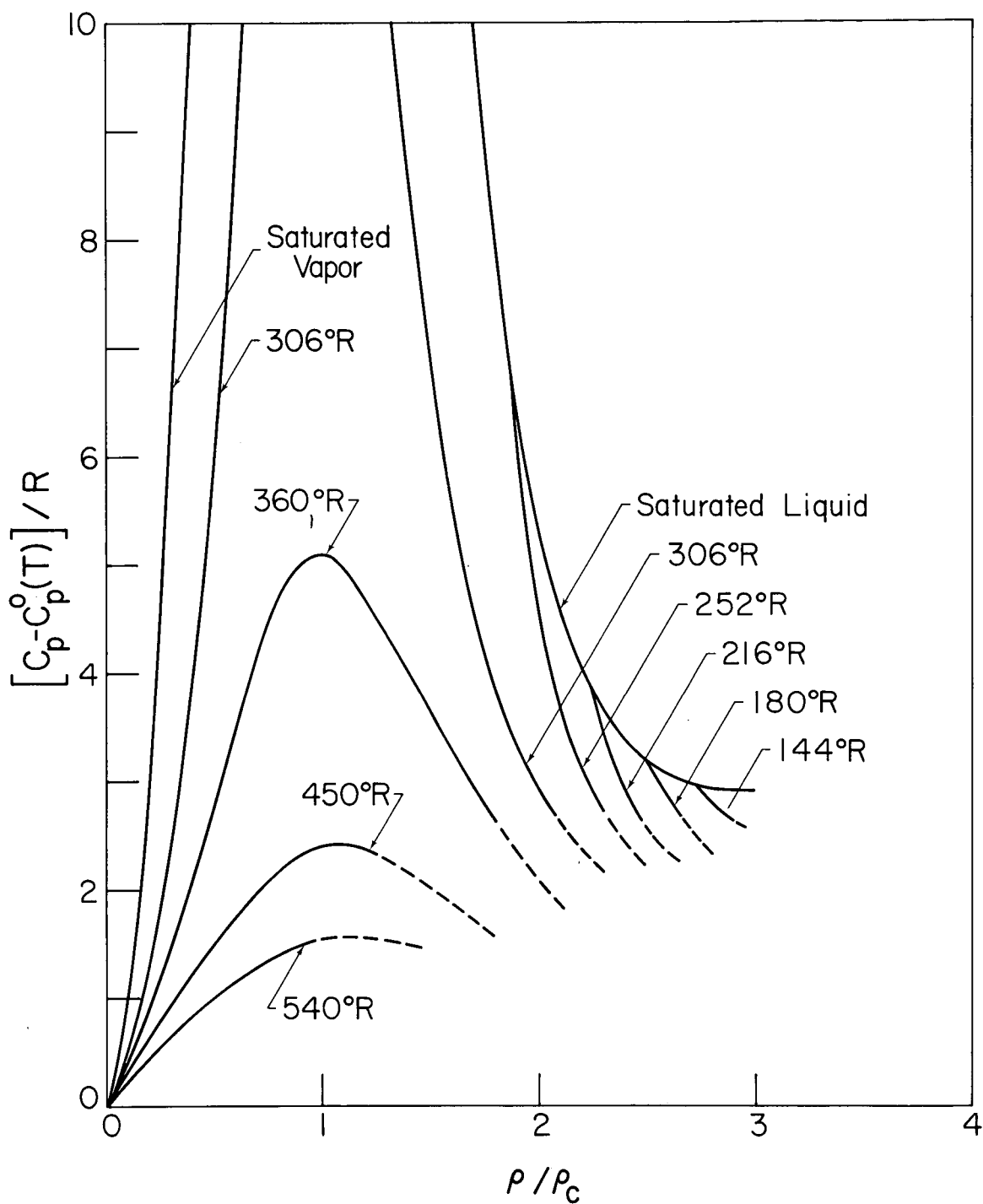


Figure 7. Heat capacity of oxygen at constant pressure; dashed portions indicate extrapolations.

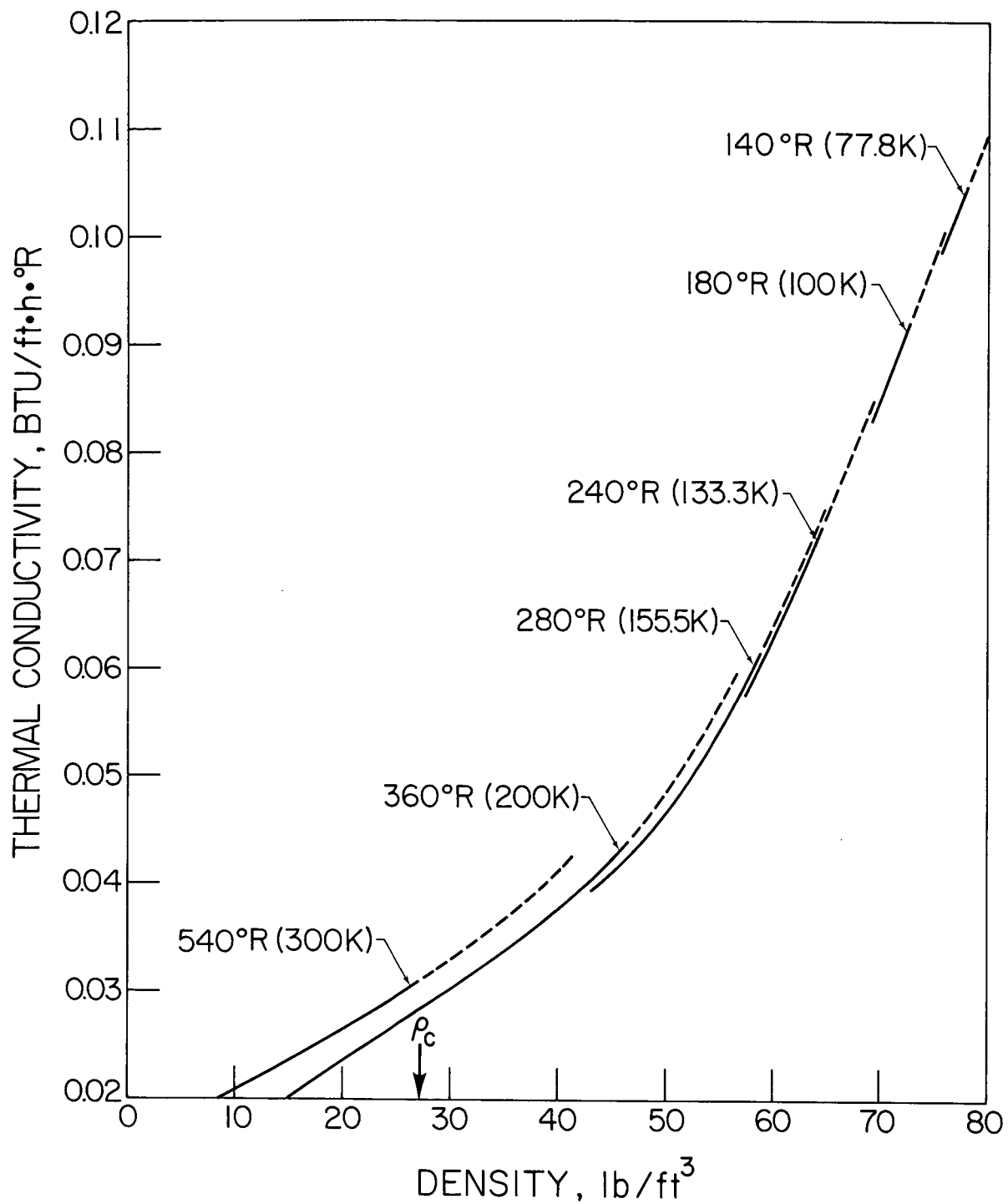


Figure 8. Thermal conductivity of oxygen; dashed portions indicate extrapolations.

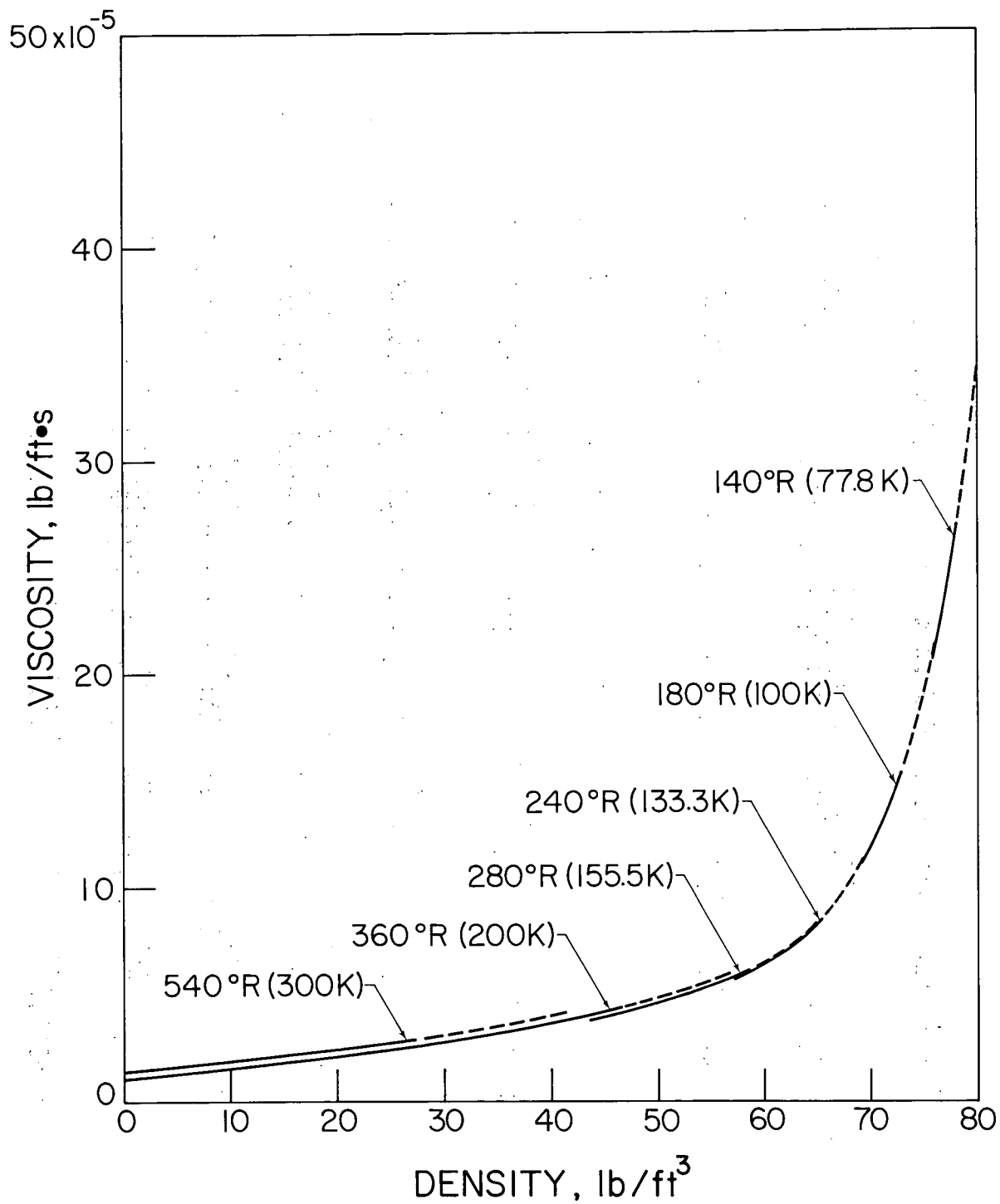


Figure 9. Viscosity of oxygen; dashed portions indicate extrapolations.

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

5000.000 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	C _v BTU / LB -R	C _p -R	VELOCITY OF SOUND FT/SEC
* 104.777	0.01208	2390	320	-82.38	-71.20	0.5087	0.268	0.389	4010
110	0.01218	2300	308	-80.44	-69.16	0.5276	0.264	0.389	3958
120	0.01238	2134	285	-76.75	-65.29	0.5614	0.257	0.387	3855
130	0.01259	1978	264	-73.08	-61.42	0.5923	0.251	0.386	3750
140	0.01280	1832	244	-69.42	-57.57	0.6208	0.246	0.384	3643
150	0.01303	1695	226	-65.79	-53.73	0.6473	0.241	0.383	3535
160	0.01326	1568	209	-62.18	-49.91	0.6720	0.236	0.382	3427
170	0.01350	1448	194	-58.59	-46.10	0.6951	0.232	0.380	3320
180	0.01374	1337	180	-55.03	-42.30	0.7168	0.227	0.379	3214
190	0.01400	1233	166	-51.48	-38.51	0.7373	0.223	0.378	3111
200	0.01427	1136	154	-47.95	-34.73	0.7567	0.219	0.377	3012
210	0.01456	1046	143	-44.44	-30.97	0.7751	0.214	0.376	2918
220	0.01486	962	133	-40.96	-27.21	0.7925	0.209	0.375	2830
230	0.01517	884	124	-37.50	-23.46	0.8092	0.202	0.374	2750
240	0.01551	813	116	-33.98	-19.61	0.8256	0.205	0.383	2652
250	0.01586	788	108	-30.50	-15.82	0.8410	0.203	0.374	2593
260	0.01623	672	99	-26.99	-11.96	0.8562	0.201	0.388	2449
270	0.01662	646	92	-23.53	-8.14	0.8706	0.199	0.379	2389
280	0.01705	555	85	-20.04	-4.26	0.8847	0.196	0.391	2263
290	0.01748	531	79	-16.61	-0.42	0.8982	0.198	0.389	2199
300	0.01796	466	73	-13.11	3.53	0.9115	0.195	0.398	2101
310	0.01846	455	68	-9.65	7.44	0.9244	0.194	0.390	2059
320	0.01900	405	62	-6.16	11.44	0.9370	0.194	0.399	1967
330	0.01956	388	58	-2.74	15.37	0.9491	0.193	0.393	1916
340	0.02017	346	53	0.70	19.37	0.9611	0.191	0.401	1834
350	0.02079	338	49	4.06	23.31	0.9725	0.189	0.391	1798
360	0.02146	303	46	7.42	27.29	0.9837	0.187	0.397	1726
370	0.02215	298	42	10.67	31.18	0.9944	0.185	0.385	1697
380	0.02290	269	39	13.92	35.12	1.0049	0.182	0.392	1637
390	0.02366	257	37	17.08	38.98	1.0149	0.180	0.392	1608
400	0.02448	250	34	20.25	42.91	1.0249	0.179	0.389	1587
410	0.02528	250	32	23.29	46.70	1.0342	0.178	0.377	1567
420	0.02610	241	30	26.26	50.43	1.0432	0.177	0.374	1538
430	0.02695	244	28	29.18	54.13	1.0519	0.176	0.363	1528
440	0.02784	221	27	32.06	57.84	1.0604	0.175	0.375	1484
450	0.02876	229	25	34.90	61.53	1.0687	0.174	0.363	1490
460	0.02965	230	24	37.64	65.09	1.0765	0.173	0.355	1478
470	0.03054	228	22	40.30	68.58	1.0840	0.172	0.350	1464
480	0.03144	228	21	42.91	72.02	1.0913	0.171	0.344	1455
490	0.03234	226	20	45.45	75.39	1.0982	0.170	0.340	1444
500	0.03323	237	19	47.92	78.69	1.1049	0.169	0.327	1455
510	0.03414	236	18	50.36	81.97	1.1114	0.168	0.324	1448
520	0.03506	232	17	52.75	85.21	1.1177	0.167	0.322	1440
530	0.03598	233	17	55.09	88.40	1.1238	0.166	0.319	1437
540	0.03689	241	16	57.38	91.54	1.1296	0.165	0.312	1451
550	0.03781	246	15	59.64	94.64	1.1353	0.164	0.306	1456
560	0.03871	245	15	61.85	97.70	1.1408	0.163	0.304	1453
570	0.03959	254	14	64.01	100.67	1.1461	0.162	0.296	1466
580	0.04049	254	14	66.15	103.64	1.1513	0.161	0.294	1463
590	0.04136	262	13	68.23	106.53	1.1562	0.160	0.288	1476
600	0.04225	261	13	70.30	109.42	1.1611	0.159	0.286	1474

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

5000.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	-V(DP/DV)	-(DV/JT)/V	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R	BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	SQ FT/HR		
* 104.777	82.810	241	14.41	197953	0.001617	0.1142	48.93	0.0035	1.5787	6.005
110	82.111	239	14.17	188822	0.001629	0.1130	44.68	0.0035	1.5731	5.531
120	80.774	234	13.71	172349	0.001654	0.1105	37.68	0.0035	1.5623	4.752
130	79.439	230	13.22	157133	0.001680	0.1078	31.93	0.0035	1.5516	4.113
140	78.105	225	12.73	143096	0.001708	0.1049	27.20	0.0035	1.5410	3.589
150	76.771	220	12.25	130162	0.001738	0.1018	23.31	0.0035	1.5304	3.157
160	75.436	215	11.77	118257	0.001771	0.0987	20.11	0.0034	1.5199	2.800
170	74.098	211	11.30	107312	0.001807	0.0954	17.46	0.0034	1.5094	2.506
180	72.757	205	10.86	97260	0.001847	0.0922	15.27	0.0033	1.4989	2.262
190	71.410	200	10.45	88036	0.001891	0.0889	13.46	0.0033	1.4884	2.062
200	70.055	194	10.07	79579	0.001941	0.0857	11.96	0.0032	1.4779	1.896
210	68.690	188	9.75	71833	0.001997	0.0824	10.70	0.0032	1.4673	1.759
220	67.311	182	9.50	64744	0.002061	0.0792	9.66	0.0031	1.4568	1.647
230	65.915	175	9.31	58263	0.002133	0.0760	8.78	0.0031	1.4461	1.555
240	64.463	173	8.79	52392	0.002219	0.0728	8.03	0.0029	1.4350	1.521
250	63.062	173	8.39	49710	0.002164	0.0698	7.43	0.0030	1.4244	1.433
260	61.598	161	8.02	41379	0.002402	0.0668	6.91	0.0028	1.4134	1.443
270	60.163	160	7.68	38863	0.002364	0.0640	6.48	0.0028	1.4027	1.382
280	58.665	150	7.35	32587	0.002597	0.0612	6.10	0.0027	1.3915	1.401
290	57.193	150	6.95	30376	0.002587	0.0586	5.83	0.0026	1.3806	1.392
300	55.665	142	6.70	25965	0.002801	0.0561	5.59	0.0025	1.3693	1.429
310	54.164	142	6.43	24653	0.002741	0.0537	5.37	0.0025	1.3583	1.403
320	52.618	136	6.13	21310	0.002927	0.0515	5.15	0.0025	1.3471	1.436
330	51.127	135	5.86	19861	0.002903	0.0494	4.94	0.0025	1.3362	1.413
340	49.590	129	5.62	17167	0.003101	0.0475	4.74	0.0024	1.3252	1.441
350	48.103	129	5.42	16259	0.003032	0.0457	4.56	0.0024	1.3145	1.403
360	46.595	123	5.22	14123	0.003223	0.0440	4.38	0.0024	1.3037	1.422
370	45.148	123	5.05	13458	0.003132	0.0425	4.22	0.0024	1.2935	1.376
380	43.677	118	4.91	11770	0.003322	0.0411	4.06	0.0024	1.2831	1.394
390	42.274	116	4.81	10851	0.003380	0.0399	3.92	0.0024	1.2732	1.388
400	40.858	115	4.71	10203	0.003373	0.0387	3.79	0.0024	1.2633	1.371
410	39.558	116	4.55	9880	0.003243	0.0377	3.67	0.0025	1.2543	1.325
420	38.312	115	4.43	9250	0.003240	0.0368	3.57	0.0026	1.2457	1.306
430	37.104	117	4.31	9053	0.003105	0.0359	3.47	0.0027	1.2374	1.262
440	35.918	112	4.22	7946	0.003336	0.0353	3.38	0.0026	1.2293	1.296
450	34.772	115	4.15	7977	0.003145	0.0345	3.30	0.0027	1.2214	1.250
460	33.728	117	4.05	7761	0.003046	0.0339	3.23	0.0028	1.2144	1.217
470	32.746	117	3.96	7462	0.002991	0.0334	3.17	0.0029	1.2077	1.194
480	31.806	118	3.88	7244	0.002918	0.0329	3.11	0.0030	1.2014	1.169
490	30.920	118	3.81	6980	0.002874	0.0325	3.06	0.0031	1.1954	1.151
500	30.094	122	3.75	7122	0.002684	0.0321	3.02	0.0033	1.1899	1.106
510	29.288	123	3.70	6900	0.002641	0.0318	2.98	0.0034	1.1845	1.090
520	28.521	122	3.65	6630	0.002628	0.0315	2.94	0.0034	1.1794	1.081
530	27.792	123	3.62	6463	0.002585	0.0312	2.91	0.0035	1.1746	1.068
540	27.108	126	3.59	6535	0.002463	0.0310	2.88	0.0037	1.1700	1.041
550	26.451	129	3.56	6499	0.002381	0.0308	2.85	0.0038	1.1657	1.021
560	25.831	129	3.52	6334	0.002348	0.0306	2.83	0.0039	1.1616	1.011
570	25.258	133	3.50	6420	0.002234	0.0305	2.81	0.0041	1.1578	0.985
580	24.696	133	3.47	6264	0.002207	0.0303	2.79	0.0042	1.1542	0.976
590	24.177	137	3.44	6340	0.002107	0.0302	2.78	0.0043	1.1508	0.953
600	23.666	137	3.42	6188	0.002087	0.0301	2.77	0.0044	1.1474	0.946

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

5500.000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM	ISOCORE	INTERNAL	ENTHALPY	ENTROPY	C _v	C _p	VELOCITY
DEG. R	CU FT/LB	DERIVATIVE	DERIVATIVE	ENERGY	BTU/LB	BTU/LB-R	BTU / LB -R		OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB					FT/SEC
* 105.452	0.01206	2419	320	-82.29	-70.01	0.5094	0.268	0.389	4029
110	0.01215	2341	309	-80.61	-68.24	0.5258	0.265	0.388	3984
120	0.01234	2176	287	-76.94	-64.37	0.5595	0.258	0.386	3883
130	0.01255	2021	266	-73.29	-60.51	0.5904	0.252	0.385	3779
140	0.01276	1876	246	-69.66	-56.67	0.6188	0.247	0.383	3674
150	0.01298	1740	228	-66.06	-52.84	0.6452	0.242	0.382	3568
160	0.01320	1613	212	-62.47	-49.03	0.6698	0.237	0.380	3462
170	0.01343	1494	196	-58.91	-45.23	0.6928	0.233	0.379	3357
180	0.01368	1383	182	-55.37	-41.45	0.7145	0.229	0.378	3253
190	0.01393	1280	169	-51.86	-37.68	0.7349	0.225	0.376	3153
200	0.01419	1184	157	-48.37	-33.92	0.7541	0.220	0.375	3057
210	0.01446	1094	146	-44.90	-30.18	0.7724	0.215	0.374	2965
220	0.01475	1011	136	-41.46	-26.45	0.7898	0.210	0.372	2881
230	0.01505	933	127	-38.05	-22.73	0.8063	0.203	0.370	2804
240	0.01537	906	119	-34.60	-18.95	0.8224	0.206	0.371	2749
250	0.01571	788	111	-31.12	-15.12	0.8380	0.204	0.382	2613
260	0.01605	749	103	-27.71	-11.37	0.8527	0.202	0.377	2542
270	0.01641	716	95	-24.32	-7.60	0.8669	0.200	0.371	2479
280	0.01680	618	88	-20.89	-3.78	0.8808	0.198	0.381	2350
290	0.01721	594	81	-17.53	-0.00	0.8941	0.199	0.377	2282
300	0.01765	521	76	-14.09	3.89	0.9072	0.196	0.388	2188
310	0.01811	497	71	-10.72	7.72	0.9198	0.195	0.385	2132
320	0.01860	443	66	-7.31	11.63	0.9322	0.194	0.395	2043
330	0.01910	437	61	-3.96	15.49	0.9441	0.194	0.384	2005
340	0.01963	415	57	-0.64	19.35	0.9556	0.192	0.381	1952
350	0.02020	371	53	2.68	23.25	0.9669	0.190	0.388	1873
360	0.02078	362	49	5.93	27.09	0.9777	0.188	0.380	1838
370	0.02140	325	46	9.15	30.95	0.9883	0.186	0.386	1767
380	0.02203	319	42	12.29	34.72	0.9984	0.184	0.376	1739
390	0.02269	308	40	15.37	38.47	1.0081	0.182	0.371	1706
400	0.02338	268	37	18.40	42.22	1.0176	0.179	0.387	1637
410	0.02413	279	35	21.47	46.04	1.0270	0.178	0.376	1653
420	0.02486	286	33	24.42	49.74	1.0360	0.177	0.362	1647
430	0.02559	286	31	27.29	53.35	1.0444	0.176	0.353	1627
440	0.02638	259	29	30.16	57.03	1.0529	0.175	0.363	1578
450	0.02714	249	28	32.92	60.56	1.0608	0.174	0.363	1550
460	0.02793	245	26	35.65	64.09	1.0686	0.173	0.361	1537
470	0.02876	257	25	38.37	67.67	1.0763	0.173	0.348	1551
480	0.02956	257	24	40.99	71.10	1.0835	0.172	0.342	1539
490	0.03033	271	23	43.52	74.40	1.0903	0.171	0.328	1549
500	0.03113	265	21	46.02	77.73	1.0970	0.170	0.326	1533
510	0.03193	263	20	48.48	81.00	1.1035	0.169	0.322	1523
520	0.03274	259	20	50.88	84.22	1.1098	0.168	0.320	1510
530	0.03355	256	19	53.24	87.41	1.1158	0.167	0.318	1502
540	0.03434	267	18	55.53	90.50	1.1216	0.166	0.308	1514
550	0.03516	261	17	57.81	93.62	1.1273	0.165	0.308	1502
560	0.03597	258	17	60.04	96.68	1.1328	0.164	0.308	1496
570	0.03680	266	16	62.24	99.72	1.1382	0.163	0.302	1510
580	0.03762	274	16	64.42	102.73	1.1435	0.162	0.296	1521
590	0.03840	283	15	66.53	105.64	1.1484	0.161	0.289	1533
600	0.03921	281	14	68.62	108.55	1.1533	0.160	0.288	1529

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

5500.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(OP/DU)	-V(OP/DV)	-(DV/DT)/V	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R ⁻¹	BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	SQ FT/HR		
* 105.452	82.928	244	14.38	200628	0.001596	0.1145	49.69	0.0036	1.5797	6.075
110	82.326	242	14.18	192704	0.001606	0.1135	45.95	0.0036	1.5748	5.657
120	81.006	237	13.71	176240	0.001628	0.1110	38.80	0.0035	1.5642	4.862
130	79.689	233	13.23	161032	0.001651	0.1084	32.93	0.0035	1.5536	4.210
140	78.374	229	12.74	146999	0.001676	0.1055	28.09	0.0035	1.5431	3.674
150	77.062	224	12.25	134067	0.001703	0.1025	24.10	0.0035	1.5327	3.231
160	75.750	220	11.77	122161	0.001731	0.0995	20.81	0.0035	1.5224	2.865
170	74.438	215	11.31	111212	0.001763	0.0963	18.09	0.0034	1.5120	2.562
180	73.125	210	10.87	101150	0.001798	0.0932	15.84	0.0034	1.5017	2.311
190	71.808	205	10.47	91912	0.001837	0.0900	13.97	0.0033	1.4915	2.103
200	70.486	200	10.11	83436	0.001880	0.0868	12.41	0.0033	1.4812	1.931
210	69.157	194	9.80	75664	0.001929	0.0836	11.11	0.0032	1.4709	1.788
220	67.818	187	9.55	68544	0.001984	0.0805	10.03	0.0032	1.4606	1.669
230	66.465	181	9.39	62023	0.002047	0.0774	9.12	0.0031	1.4503	1.570
240	65.074	183	8.90	58958	0.002025	0.0743	8.34	0.0031	1.4397	1.501
250	63.667	173	8.51	50187	0.002206	0.0712	7.69	0.0029	1.4290	1.484
260	62.313	171	8.14	46663	0.002200	0.0684	7.16	0.0029	1.4188	1.420
270	60.939	170	7.81	43616	0.002184	0.0657	6.72	0.0029	1.4085	1.365
280	59.508	159	7.48	36760	0.002394	0.0630	6.32	0.0028	1.3978	1.378
290	58.114	160	7.05	34508	0.002361	0.0604	6.00	0.0028	1.3874	1.347
300	56.647	151	6.86	29541	0.002577	0.0579	5.76	0.0026	1.3766	1.392
310	55.233	149	6.58	27426	0.002584	0.0556	5.55	0.0026	1.3662	1.383
320	53.767	143	6.31	23824	0.002767	0.0534	5.33	0.0025	1.3554	1.422
330	52.353	144	6.03	22871	0.002674	0.0513	5.13	0.0026	1.3451	1.383
340	50.948	142	5.80	21133	0.002689	0.0494	4.94	0.0025	1.3349	1.371
350	49.511	135	5.59	18382	0.002867	0.0476	4.76	0.0025	1.3246	1.395
360	48.126	135	5.41	17401	0.002819	0.0460	4.59	0.0025	1.3147	1.364
370	46.730	129	5.23	15173	0.003000	0.0445	4.42	0.0025	1.3047	1.384
380	45.391	129	5.08	14481	0.002927	0.0431	4.28	0.0025	1.2952	1.344
390	44.073	127	4.95	13556	0.002921	0.0418	4.14	0.0026	1.2859	1.322
400	42.767	120	4.83	11463	0.003234	0.0406	4.01	0.0025	1.2767	1.373
410	41.441	123	4.79	11568	0.003057	0.0395	3.88	0.0025	1.2674	1.329
420	40.224	126	4.66	11516	0.002884	0.0386	3.77	0.0026	1.2589	1.274
430	39.082	127	4.52	11164	0.002785	0.0377	3.67	0.0027	1.2510	1.235
440	37.910	122	4.41	9831	0.002981	0.0369	3.57	0.0027	1.2429	1.265
450	36.848	120	4.31	9188	0.003010	0.0362	3.49	0.0027	1.2356	1.258
460	35.806	120	4.24	8764	0.003002	0.0356	3.42	0.0028	1.2285	1.249
470	34.765	124	4.17	8941	0.002802	0.0350	3.34	0.0029	1.2214	1.199
480	33.828	125	4.08	8693	0.002729	0.0345	3.28	0.0030	1.2150	1.172
490	32.975	130	3.99	8920	0.002526	0.0340	3.23	0.0032	1.2093	1.119
500	32.125	129	3.92	8506	0.002521	0.0336	3.18	0.0032	1.2035	1.110
510	31.316	130	3.86	8244	0.002479	0.0333	3.14	0.0033	1.1981	1.093
520	30.545	130	3.80	7896	0.002472	0.0329	3.09	0.0034	1.1929	1.084
530	29.803	130	3.75	7640	0.002444	0.0326	3.06	0.0034	1.1879	1.071
540	29.121	134	3.70	7768	0.002307	0.0324	3.03	0.0036	1.1834	1.037
550	28.441	133	3.67	7421	0.002321	0.0321	3.00	0.0037	1.1789	1.035
560	27.798	133	3.64	7161	0.002318	0.0319	2.97	0.0037	1.1746	1.030
570	27.177	136	3.62	7225	0.002224	0.0317	2.94	0.0039	1.1705	1.009
580	26.583	139	3.60	7275	0.002133	0.0316	2.92	0.0040	1.1666	0.987
590	26.042	142	3.57	7369	0.002034	0.0314	2.91	0.0042	1.1630	0.962
600	25.506	142	3.54	7167	0.002022	0.0313	2.89	0.0043	1.1595	0.956

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

6000.000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM	ISOCHORE	INTERNAL	ENTHALPY	ENTROPY	C_v	C_p	VELOCITY
DEG. R	CU FT/LB	DERIVATIVE	DERIVATIVE	ENERGY					OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC
* 106.124	0.01204	2448	320	-82.19	-68.82	0.5101	0.269	0.388	4048
110	0.01212	2381	311	-80.77	-67.31	0.5240	0.266	0.388	4010
120	0.01231	2217	289	-77.12	-63.45	0.5576	0.259	0.386	3910
130	0.01251	2063	268	-73.50	-59.60	0.5885	0.253	0.384	3808
140	0.01272	1919	248	-69.89	-55.76	0.6169	0.248	0.382	3704
150	0.01293	1783	230	-66.31	-51.94	0.6432	0.243	0.381	3600
160	0.01315	1657	214	-62.75	-48.14	0.6677	0.238	0.379	3495
170	0.01337	1539	198	-59.22	-44.36	0.6907	0.234	0.378	3392
180	0.01361	1429	184	-55.71	-40.59	0.7122	0.230	0.376	3291
190	0.01385	1326	171	-52.22	-36.83	0.7325	0.226	0.375	3193
200	0.01410	1230	159	-48.76	-33.09	0.7517	0.221	0.373	3099
210	0.01437	1141	148	-45.33	-29.37	0.7699	0.217	0.371	3011
220	0.01464	1058	138	-41.94	-25.67	0.7871	0.211	0.369	2929
230	0.01493	981	130	-38.57	-21.98	0.8035	0.204	0.367	2855
240	0.01524	906	122	-35.13	-18.19	0.8196	0.207	0.377	2765
250	0.01555	862	114	-31.75	-14.47	0.8348	0.205	0.374	2696
260	0.01588	839	106	-28.39	-10.75	0.8494	0.203	0.365	2642
270	0.01623	716	98	-24.99	-6.96	0.8637	0.201	0.379	2498
280	0.01659	689	91	-21.67	-3.24	0.8772	0.199	0.371	2441
290	0.01696	658	85	-18.36	0.49	0.8903	0.200	0.369	2368
300	0.01737	559	79	-15.01	4.29	0.9032	0.197	0.383	2245
310	0.01779	557	74	-11.69	8.08	0.9156	0.196	0.374	2219
320	0.01825	486	69	-8.34	11.93	0.9278	0.195	0.389	2118
330	0.01871	473	65	-5.05	15.73	0.9395	0.195	0.383	2077
340	0.01918	469	60	-1.80	19.51	0.9508	0.193	0.371	2042
350	0.01970	403	56	1.47	23.36	0.9620	0.192	0.384	1949
360	0.02022	396	52	4.64	27.11	0.9725	0.190	0.377	1910
370	0.02077	385	49	7.78	30.85	0.9828	0.188	0.371	1876
380	0.02134	346	45	10.89	34.60	0.9928	0.185	0.377	1806
390	0.02193	340	43	13.92	38.28	1.0023	0.183	0.368	1779
400	0.02253	326	40	16.88	41.91	1.0115	0.181	0.365	1744
410	0.02315	326	37	19.80	45.52	1.0204	0.179	0.355	1728
420	0.02385	295	36	22.77	49.27	1.0295	0.177	0.373	1695
430	0.02454	305	34	25.67	52.93	1.0381	0.177	0.360	1697
440	0.02520	304	32	28.48	56.48	1.0462	0.176	0.351	1678
450	0.02586	284	30	31.19	59.92	1.0540	0.175	0.355	1636
460	0.02657	290	29	33.92	63.44	1.0617	0.174	0.346	1635
470	0.02727	274	27	36.56	66.87	1.0691	0.173	0.349	1602
480	0.02800	267	26	39.19	70.30	1.0763	0.172	0.350	1587
490	0.02877	285	25	41.82	73.78	1.0835	0.172	0.336	1609
500	0.02949	284	24	44.34	77.10	1.0902	0.171	0.331	1597
510	0.03017	298	23	46.77	80.30	1.0965	0.170	0.319	1608
520	0.03089	289	22	49.19	83.51	1.1027	0.169	0.318	1588
530	0.03162	287	21	51.56	86.69	1.1088	0.168	0.315	1578
540	0.03234	280	20	53.89	89.81	1.1146	0.167	0.314	1562
550	0.03304	291	19	56.15	92.87	1.1202	0.166	0.305	1574
560	0.03378	287	18	58.41	95.93	1.1258	0.165	0.304	1564
570	0.03448	298	18	60.60	98.90	1.1310	0.164	0.296	1576
580	0.03522	289	17	62.78	101.92	1.1363	0.163	0.297	1562
590	0.03595	282	16	64.92	104.86	1.1413	0.162	0.298	1551
600	0.03670	291	16	67.04	107.82	1.1463	0.161	0.293	1566

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

6000.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(OH/DV)	V(OP/DV)	-V(OP/DV)	-(DV/DT)/V	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R	BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	SQ FT/HR		
* 106.124	83.045	246	14.35	203293	0.001576	0.1147	50.47	0.0036	1.5806	6.147
110	82.538	245	14.18	196560	0.001583	0.1139	47.23	0.0036	1.5765	5.786
120	81.234	241	13.71	180104	0.001603	0.1115	39.94	0.0036	1.5660	4.975
130	79.934	237	13.23	164900	0.001624	0.1089	33.94	0.0035	1.5556	4.309
140	78.638	232	12.74	150870	0.001646	0.1062	28.99	0.0035	1.5452	3.760
150	77.346	228	12.26	137937	0.001669	0.1033	24.91	0.0035	1.5350	3.307
160	76.056	224	11.78	126027	0.001694	0.1003	21.53	0.0035	1.5248	2.932
170	74.768	219	11.32	115069	0.001722	0.0972	18.74	0.0034	1.5146	2.621
180	73.480	215	10.89	104995	0.001752	0.0941	16.42	0.0034	1.5045	2.362
190	72.192	210	10.49	95739	0.001786	0.0910	14.49	0.0034	1.4945	2.147
200	70.901	205	10.14	87241	0.001824	0.0879	12.88	0.0033	1.4844	1.958
210	69.605	199	9.84	79442	0.001867	0.0848	11.53	0.0033	1.4744	1.818
220	68.301	193	9.60	72287	0.001915	0.0817	10.41	0.0032	1.4644	1.693
230	66.987	186	9.45	65725	0.001970	0.0787	9.46	0.0032	1.4543	1.588
240	65.603	184	8.99	59437	0.002056	0.0756	8.63	0.0031	1.4437	1.551
250	64.291	182	8.62	55434	0.002053	0.0727	7.98	0.0030	1.4337	1.476
260	62.981	182	8.26	52852	0.002001	0.0699	7.43	0.0030	1.4238	1.396
270	61.614	170	7.92	44100	0.002227	0.0672	6.94	0.0029	1.4135	1.409
280	60.286	169	7.61	41561	0.002195	0.0646	6.54	0.0029	1.4036	1.353
290	58.955	169	7.17	38770	0.002184	0.0621	6.20	0.0029	1.3937	1.326
300	57.572	157	6.94	32194	0.002449	0.0597	5.93	0.0027	1.3834	1.372
310	56.206	159	6.70	31323	0.002359	0.0574	5.71	0.0027	1.3733	1.341
320	54.804	150	6.45	26644	0.002593	0.0551	5.50	0.0026	1.3630	1.397
330	53.453	150	6.21	25300	0.002552	0.0531	5.30	0.0026	1.3531	1.376
340	52.126	151	5.95	24439	0.002455	0.0513	5.12	0.0026	1.3435	1.335
350	50.755	143	5.75	20767	0.002694	0.0494	4.94	0.0025	1.3336	1.381
360	49.449	141	5.57	19579	0.002666	0.0478	4.77	0.0026	1.3241	1.355
370	48.154	141	5.40	18519	0.002636	0.0463	4.61	0.0026	1.3149	1.329
380	46.855	134	5.24	16222	0.002804	0.0449	4.46	0.0025	1.3056	1.349
390	45.607	134	5.09	15494	0.002747	0.0436	4.33	0.0026	1.2967	1.315
400	44.391	132	4.97	14456	0.002761	0.0424	4.20	0.0026	1.2881	1.300
410	43.195	133	4.85	14067	0.002664	0.0414	4.08	0.0027	1.2797	1.258
420	41.928	128	4.85	12375	0.002917	0.0403	3.96	0.0026	1.2708	1.318
430	40.758	131	4.75	12420	0.002750	0.0393	3.85	0.0027	1.2626	1.268
440	39.677	132	4.61	12058	0.002664	0.0385	3.76	0.0028	1.2551	1.232
450	38.667	129	4.49	11000	0.002757	0.0379	3.67	0.0028	1.2482	1.240
460	37.630	131	4.40	10917	0.002636	0.0372	3.59	0.0029	1.2410	1.203
470	36.665	129	4.31	10062	0.002716	0.0366	3.52	0.0029	1.2344	1.210
480	35.716	128	4.25	9552	0.002737	0.0360	3.45	0.0029	1.2279	1.209
490	34.762	133	4.19	9914	0.002522	0.0355	3.39	0.0030	1.2214	1.156
500	33.911	134	4.10	9635	0.002467	0.0350	3.33	0.0031	1.2156	1.134
510	33.142	139	4.03	9869	0.002298	0.0347	3.29	0.0033	1.2104	1.088
520	32.370	138	3.96	9369	0.002312	0.0343	3.24	0.0033	1.2052	1.083
530	31.627	138	3.90	9076	0.002283	0.0340	3.20	0.0034	1.2002	1.069
540	30.925	137	3.84	8667	0.002289	0.0337	3.17	0.0035	1.1954	1.063
550	30.263	141	3.79	8811	0.002165	0.0334	3.13	0.0036	1.1910	1.030
560	29.605	141	3.75	8509	0.002155	0.0332	3.10	0.0037	1.1866	1.022
570	29.002	145	3.71	8636	0.002046	0.0330	3.08	0.0038	1.1826	0.993
580	28.389	143	3.68	8211	0.002076	0.0328	3.05	0.0039	1.1785	0.995
590	27.817	142	3.66	7854	0.002100	0.0326	3.03	0.0039	1.1747	0.997
600	27.245	145	3.65	7918	0.002024	0.0325	3.01	0.0041	1.1709	0.979

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

6500.000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM	ISOCHORE	INTERNAL	ENTHALPY	ENTROPY	C_v	C_p	VELOCITY
DEG. R	CU FT/LB	DERIVATIVE	DERIVATIVE	ENERGY					OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC
* 106.792	0.01202	2476	320	-82.10	-67.63	0.5108	0.269	0.388	4066
110	0.01209	2422	313	-80.93	-66.39	0.5222	0.267	0.387	4035
120	0.01228	2258	290	-77.30	-62.53	0.5558	0.260	0.385	3936
130	0.01247	2105	270	-73.69	-58.68	0.5866	0.254	0.383	3835
140	0.01267	1961	250	-70.11	-54.86	0.6149	0.249	0.382	3733
150	0.01288	1826	232	-66.55	-51.05	0.6412	0.244	0.380	3630
160	0.01310	1701	215	-63.02	-47.25	0.6657	0.240	0.378	3528
170	0.01332	1583	200	-59.51	-43.48	0.6886	0.235	0.377	3426
180	0.01355	1474	186	-56.03	-39.72	0.7101	0.231	0.375	3327
190	0.01378	1372	173	-52.57	-35.98	0.7303	0.227	0.373	3231
200	0.01403	1276	161	-49.14	-32.26	0.7494	0.223	0.371	3140
210	0.01428	1188	151	-45.74	-28.56	0.7674	0.218	0.369	3054
220	0.01454	1105	141	-42.38	-24.88	0.7846	0.212	0.367	2974
230	0.01482	1028	132	-39.06	-21.22	0.8008	0.206	0.364	2903
240	0.01511	956	124	-35.72	-17.54	0.8165	0.208	0.371	2810
250	0.01542	862	116	-32.30	-13.74	0.8320	0.206	0.380	2711
260	0.01573	839	109	-28.96	-10.02	0.8466	0.204	0.372	2660
270	0.01605	795	101	-25.67	-6.34	0.8604	0.202	0.368	2589
280	0.01639	759	94	-22.38	-2.66	0.8739	0.200	0.364	2527
290	0.01675	658	88	-19.08	1.08	0.8870	0.202	0.377	2388
300	0.01712	631	82	-15.83	4.78	0.8995	0.199	0.370	2335
310	0.01751	584	77	-12.57	8.51	0.9117	0.197	0.375	2269
320	0.01793	525	72	-9.30	12.28	0.9237	0.196	0.384	2179
330	0.01836	516	68	-6.05	16.05	0.9353	0.196	0.378	2150
340	0.01881	503	63	-2.83	19.80	0.9465	0.194	0.372	2111
350	0.01927	440	59	0.35	23.54	0.9573	0.193	0.382	2011
360	0.01975	436	55	3.50	27.27	0.9678	0.191	0.373	1986
370	0.02024	420	52	6.58	30.94	0.9779	0.189	0.368	1947
380	0.02075	407	49	9.62	34.60	0.9876	0.187	0.362	1913
390	0.02127	404	45	12.60	38.20	0.9970	0.185	0.352	1889
400	0.02183	360	43	15.56	41.84	1.0062	0.183	0.361	1817
410	0.02238	343	40	18.42	45.36	1.0149	0.181	0.359	1779
420	0.02297	344	38	21.27	48.91	1.0235	0.179	0.350	1766
430	0.02357	290	36	24.07	52.44	1.0317	0.177	0.378	1694
440	0.02423	326	35	26.95	56.12	1.0402	0.176	0.355	1747
450	0.02485	342	33	29.69	59.60	1.0480	0.175	0.340	1754
460	0.02546	341	31	32.35	63.00	1.0555	0.174	0.333	1736
470	0.02609	312	30	34.99	66.38	1.0628	0.174	0.342	1686
480	0.02673	321	28	37.60	69.77	1.0699	0.173	0.332	1689
490	0.02738	299	27	40.15	73.11	1.0768	0.172	0.339	1651
500	0.02805	289	26	42.69	76.46	1.0836	0.171	0.341	1634
510	0.02877	313	25	45.24	79.86	1.0903	0.170	0.326	1665
520	0.02940	328	24	47.65	83.03	1.0965	0.170	0.314	1676
530	0.03004	325	23	50.03	86.19	1.1025	0.169	0.310	1664
540	0.03069	314	22	52.36	89.31	1.1083	0.168	0.311	1641
550	0.03136	311	21	54.67	92.41	1.1140	0.167	0.308	1630
560	0.03198	323	20	56.91	95.40	1.1194	0.166	0.300	1642
570	0.03264	313	19	59.13	98.42	1.1247	0.165	0.300	1623
580	0.03328	324	19	61.30	101.36	1.1298	0.164	0.293	1635
590	0.03395	318	18	63.46	104.32	1.1349	0.163	0.292	1625
600	0.03462	308	17	65.59	107.25	1.1398	0.162	0.293	1607

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

6500.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(OP/DO)	-V(OP/DV)	-(DV/DT)/V	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R	BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	SQ FT/HR		
* 106.792	83.161	249	14.32	205947	0.001556	0.1150	51.25	0.0036	1.5815	6.219
110	82.746	248	14.18	200392	0.001561	0.1143	48.54	0.0036	1.5782	5.917
120	81.457	244	13.71	183941	0.001579	0.1120	41.10	0.0036	1.5678	5.089
130	80.174	240	13.23	168739	0.001597	0.1095	34.97	0.0036	1.5575	4.409
140	78.896	236	12.74	154709	0.001617	0.1068	29.91	0.0035	1.5473	3.849
150	77.623	232	12.26	141773	0.001637	0.1040	25.73	0.0035	1.5372	3.385
160	76.354	228	11.78	129856	0.001659	0.1010	22.26	0.0035	1.5271	3.000
170	75.088	224	11.33	118887	0.001684	0.0981	19.39	0.0035	1.5171	2.681
180	73.825	219	10.90	108798	0.001710	0.0950	17.00	0.0034	1.5072	2.414
190	72.563	214	10.51	99522	0.001740	0.0920	15.01	0.0034	1.4974	2.192
200	71.300	209	10.16	90999	0.001773	0.0889	13.35	0.0034	1.4875	2.006
210	70.034	204	9.87	83170	0.001810	0.0859	11.96	0.0033	1.4777	1.850
220	68.763	198	9.65	75978	0.001853	0.0829	10.79	0.0033	1.4679	1.719
230	67.485	191	9.51	69373	0.001901	0.0799	9.81	0.0033	1.4581	1.607
240	66.196	190	8.99	63308	0.001957	0.0770	8.98	0.0031	1.4482	1.557
250	64.841	182	8.71	55908	0.002084	0.0740	8.25	0.0030	1.4379	1.523
260	63.556	183	8.36	53334	0.002037	0.0713	7.67	0.0030	1.4282	1.441
270	62.289	180	8.03	49496	0.002044	0.0687	7.18	0.0030	1.4186	1.387
280	61.009	178	7.73	46279	0.002038	0.0661	6.77	0.0030	1.4090	1.339
290	59.687	169	7.28	39252	0.002231	0.0636	6.40	0.0028	1.3991	1.367
300	58.404	167	7.03	36876	0.002212	0.0613	6.09	0.0028	1.3896	1.325
310	57.098	163	6.82	33347	0.002305	0.0590	5.87	0.0028	1.3799	1.343
320	55.771	156	6.55	29275	0.002452	0.0569	5.66	0.0027	1.3701	1.375
330	54.459	157	6.34	28121	0.002403	0.0548	5.47	0.0027	1.3605	1.356
340	53.175	157	6.13	26748	0.002367	0.0529	5.28	0.0027	1.3511	1.336
350	51.899	148	5.88	22856	0.002575	0.0512	5.11	0.0026	1.3418	1.373
360	50.630	149	5.72	22060	0.002504	0.0495	4.94	0.0026	1.3326	1.340
370	49.403	147	5.55	20753	0.002493	0.0480	4.79	0.0026	1.3238	1.320
380	48.187	146	5.40	19635	0.002473	0.0466	4.64	0.0027	1.3151	1.298
390	47.006	147	5.24	18979	0.002397	0.0453	4.51	0.0027	1.3067	1.261
400	45.802	140	5.10	16502	0.002585	0.0441	4.37	0.0027	1.2981	1.289
410	44.680	137	4.98	15342	0.002617	0.0430	4.26	0.0027	1.2902	1.279
420	43.537	138	4.87	14980	0.002527	0.0420	4.14	0.0028	1.2821	1.241
430	42.428	128	4.83	12323	0.002945	0.0411	4.04	0.0026	1.2743	1.336
440	41.264	137	4.81	13459	0.002597	0.0401	3.93	0.0027	1.2662	1.252
450	40.240	141	4.69	13760	0.002406	0.0393	3.84	0.0029	1.2590	1.195
460	39.282	143	4.56	13387	0.002336	0.0387	3.76	0.0030	1.2524	1.165
470	38.336	137	4.47	11963	0.002487	0.0380	3.68	0.0029	1.2459	1.191
480	37.406	141	4.38	12008	0.002359	0.0375	3.61	0.0030	1.2395	1.152
490	36.517	137	4.30	10914	0.002478	0.0369	3.55	0.0030	1.2334	1.171
500	35.644	135	4.26	10311	0.002520	0.0364	3.49	0.0030	1.2274	1.177
510	34.763	142	4.21	10896	0.002289	0.0359	3.43	0.0032	1.2214	1.118
520	34.018	147	4.13	11144	0.002140	0.0356	3.38	0.0033	1.2163	1.076
530	33.284	147	4.06	10826	0.002105	0.0352	3.34	0.0034	1.2113	1.059
540	32.580	146	3.99	10233	0.002133	0.0349	3.30	0.0034	1.2066	1.058
550	31.891	146	3.93	9909	0.002113	0.0346	3.27	0.0035	1.2019	1.046
560	31.266	150	3.88	10086	0.001997	0.0344	3.23	0.0037	1.1977	1.014
570	30.636	148	3.83	9584	0.002022	0.0342	3.20	0.0037	1.1935	1.013
580	30.048	152	3.79	9727	0.001923	0.0340	3.18	0.0039	1.1896	0.985
590	29.458	152	3.76	9381	0.001923	0.0338	3.15	0.0039	1.1856	0.980
600	28.888	150	3.72	8901	0.001957	0.0336	3.13	0.0040	1.1818	0.983

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

7000.000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM	ISOCHORE	INTERNAL	ENTHALPY	ENTROPY	C_v	C_p	VELOCITY
DEG. R	CU FT/LB	DERIVATIVE	DERIVATIVE	ENERGY	BTU/LB	BTU/LB-R	BTU / LB -R		OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB					FT/SEC
* 107.458	0.01201	2505	321	-82.01	-66.44	0.5115	0.269	0.387	4084
110	0.01206	2462	315	-81.09	-65.46	0.5205	0.267	0.386	4059
120	0.01224	2299	292	-77.47	-61.60	0.5540	0.261	0.385	3962
130	0.01244	2146	271	-73.89	-57.77	0.5848	0.255	0.383	3863
140	0.01263	2003	252	-70.32	-53.95	0.6131	0.250	0.381	3762
150	0.01284	1869	234	-66.79	-50.15	0.6393	0.245	0.379	3660
160	0.01305	1744	217	-63.27	-46.36	0.6637	0.241	0.377	3559
170	0.01326	1627	202	-59.79	-42.60	0.6865	0.236	0.375	3460
180	0.01348	1518	188	-56.33	-38.85	0.7079	0.232	0.374	3362
190	0.01371	1416	175	-52.90	-35.12	0.7281	0.228	0.372	3268
200	0.01395	1321	163	-49.50	-31.42	0.7471	0.224	0.370	3179
210	0.01420	1233	153	-46.13	-27.73	0.7651	0.219	0.367	3095
220	0.01445	1150	143	-42.80	-24.07	0.7821	0.213	0.364	3018
230	0.01471	1074	134	-39.51	-20.44	0.7983	0.207	0.361	2949
240	0.01499	1002	126	-36.22	-16.79	0.8138	0.209	0.368	2858
250	0.01529	958	119	-32.85	-13.03	0.8292	0.207	0.368	2807
260	0.01559	910	112	-29.56	-9.35	0.8436	0.206	0.366	2738
270	0.01590	795	104	-26.25	-5.64	0.8576	0.203	0.375	2605
280	0.01622	759	97	-23.01	-1.99	0.8709	0.201	0.371	2544
290	0.01655	732	91	-19.79	1.67	0.8837	0.203	0.368	2479
300	0.01690	697	84	-16.58	5.32	0.8961	0.200	0.362	2419
310	0.01726	668	79	-13.40	8.96	0.9080	0.199	0.358	2362
320	0.01766	593	75	-10.14	12.75	0.9200	0.198	0.371	2273
330	0.01805	552	70	-6.97	16.43	0.9313	0.197	0.374	2206
340	0.01847	546	66	-3.79	20.15	0.9424	0.195	0.368	2181
350	0.01891	501	62	-0.60	23.91	0.9533	0.194	0.372	2110
360	0.01933	465	58	2.44	27.50	0.9635	0.192	0.372	2044
370	0.01979	462	55	5.50	31.16	0.9735	0.190	0.363	2022
380	0.02026	444	51	8.50	34.75	0.9830	0.188	0.359	1982
390	0.02074	430	48	11.45	38.33	0.9923	0.186	0.354	1949
400	0.02123	427	45	14.34	41.85	1.0013	0.184	0.345	1927
410	0.02173	409	43	17.18	45.34	1.0099	0.182	0.343	1889
420	0.02224	401	40	19.96	48.78	1.0182	0.180	0.337	1863
430	0.02282	362	38	22.79	52.36	1.0266	0.178	0.345	1801
440	0.02329	294	36	25.37	55.55	1.0339	0.177	0.375	1698
450	0.02398	341	36	28.28	59.36	1.0425	0.176	0.353	1783
460	0.02457	361	34	31.00	62.86	1.0502	0.175	0.339	1799
470	0.02515	359	32	33.64	66.23	1.0574	0.174	0.332	1782
480	0.02567	378	31	36.14	69.41	1.0641	0.173	0.318	1792
490	0.02627	339	29	38.71	72.76	1.0710	0.173	0.331	1735
500	0.02686	352	28	41.21	76.03	1.0776	0.172	0.320	1742
510	0.02747	323	27	43.70	79.31	1.0841	0.171	0.330	1697
520	0.02810	310	26	46.16	82.58	1.0905	0.170	0.334	1679
530	0.02876	342	25	48.63	85.91	1.0968	0.169	0.316	1720
540	0.02934	356	24	50.97	89.00	1.1026	0.169	0.306	1731
550	0.02993	353	23	53.28	92.08	1.1082	0.168	0.303	1718
560	0.03052	339	22	55.54	95.11	1.1137	0.167	0.304	1692
570	0.03110	351	21	57.76	98.08	1.1190	0.166	0.296	1704
580	0.03170	346	20	59.97	101.06	1.1241	0.165	0.294	1692
590	0.03228	358	20	62.11	103.94	1.1291	0.164	0.287	1704
600	0.03288	345	19	64.25	106.87	1.1340	0.163	0.288	1683

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

7000.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	-V(DP/DV)	-V(DV/DT)/V	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R	BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	SQ FT/HR		
* 107.458	83.276	252	14.29	208591	0.001537	0.1152	52.03	0.0036	1.5825	6.292
110	82.951	251	14.18	204200	0.001541	0.1147	49.86	0.0036	1.5798	6.049
120	81.677	247	13.71	187752	0.001556	0.1125	42.27	0.0036	1.5696	5.205
130	80.409	243	13.23	172551	0.001572	0.1100	36.01	0.0036	1.5594	4.511
140	79.148	240	12.74	158518	0.001589	0.1074	30.84	0.0036	1.5493	3.939
150	77.893	236	12.26	145576	0.001607	0.1046	26.56	0.0035	1.5393	3.464
160	76.644	232	11.79	133650	0.001627	0.1018	23.01	0.0035	1.5294	3.070
170	75.400	228	11.33	122668	0.001648	0.0989	20.06	0.0035	1.5196	2.742
180	74.159	224	10.91	112561	0.001671	0.0959	17.60	0.0035	1.5098	2.468
190	72.921	219	10.52	103264	0.001696	0.0929	15.55	0.0034	1.5002	2.239
200	71.685	214	10.18	94714	0.001725	0.0900	13.84	0.0034	1.4905	2.046
210	70.447	209	9.90	86852	0.001758	0.0870	12.40	0.0034	1.4809	1.884
220	69.207	203	9.68	79622	0.001796	0.0841	11.19	0.0033	1.4713	1.746
230	67.961	196	9.56	72973	0.001839	0.0812	10.17	0.0033	1.4617	1.629
240	66.707	195	9.05	66857	0.001888	0.0783	9.30	0.0032	1.4521	1.574
250	65.392	193	8.80	62633	0.001904	0.0753	8.54	0.0031	1.4421	1.503
260	64.152	191	8.46	58374	0.001911	0.0727	7.94	0.0031	1.4327	1.437
270	62.879	180	8.12	49966	0.002078	0.0700	7.41	0.0030	1.4231	1.429
280	61.645	179	7.82	46761	0.002075	0.0675	6.98	0.0030	1.4138	1.379
290	60.408	180	7.39	44216	0.002048	0.0651	6.61	0.0029	1.4045	1.343
300	59.179	177	7.14	41236	0.002049	0.0629	6.29	0.0029	1.3953	1.305
310	57.952	176	6.86	38731	0.002036	0.0607	6.02	0.0029	1.3862	1.278
320	56.628	167	6.68	33568	0.002225	0.0584	5.81	0.0028	1.3764	1.330
330	55.399	163	6.45	30561	0.002297	0.0565	5.63	0.0027	1.3674	1.343
340	54.151	164	6.26	29557	0.002239	0.0546	5.44	0.0027	1.3582	1.320
350	52.878	159	6.05	26490	0.002340	0.0527	5.26	0.0027	1.3489	1.335
360	51.725	154	5.84	24070	0.002409	0.0512	5.11	0.0027	1.3406	1.336
370	50.526	155	5.68	23337	0.002338	0.0496	4.95	0.0027	1.3319	1.304
380	49.369	153	5.53	21925	0.002339	0.0482	4.81	0.0027	1.3236	1.288
390	48.224	152	5.39	20732	0.002330	0.0469	4.67	0.0027	1.3153	1.270
400	47.114	153	5.24	20112	0.002259	0.0457	4.55	0.0028	1.3074	1.235
410	46.026	151	5.11	18825	0.002274	0.0446	4.43	0.0028	1.2997	1.223
420	44.968	150	4.98	18029	0.002239	0.0436	4.32	0.0029	1.2922	1.199
430	43.828	144	4.88	15882	0.002400	0.0426	4.20	0.0028	1.2841	1.224
440	42.942	130	4.77	12612	0.002876	0.0419	4.12	0.0026	1.2779	1.328
450	41.706	141	4.85	14236	0.002498	0.0408	4.00	0.0028	1.2693	1.246
460	40.696	147	4.76	14679	0.002310	0.0400	3.91	0.0029	1.2622	1.192
470	39.766	148	4.64	14292	0.002247	0.0394	3.83	0.0030	1.2558	1.164
480	38.959	153	4.52	14735	0.002072	0.0389	3.77	0.0031	1.2502	1.110
490	38.061	146	4.45	12897	0.002269	0.0383	3.70	0.0030	1.2440	1.151
500	37.226	150	4.37	13102	0.002131	0.0378	3.64	0.0032	1.2382	1.109
510	36.397	144	4.30	11746	0.002281	0.0373	3.58	0.0031	1.2325	1.139
520	35.587	143	4.26	11046	0.002339	0.0369	3.53	0.0031	1.2270	1.149
530	34.768	151	4.22	11884	0.002093	0.0364	3.47	0.0033	1.2214	1.086
540	34.085	156	4.15	12135	0.001966	0.0361	3.43	0.0035	1.2168	1.048
550	33.408	156	4.08	11788	0.001940	0.0358	3.39	0.0035	1.2122	1.034
560	32.763	154	4.02	11098	0.001979	0.0355	3.36	0.0036	1.2078	1.036
570	32.152	158	3.97	11287	0.001874	0.0353	3.33	0.0037	1.2037	1.005
580	31.541	158	3.92	10923	0.001865	0.0351	3.30	0.0038	1.1996	0.996
590	30.984	162	3.87	11098	0.001772	0.0349	3.27	0.0039	1.1958	0.968
600	30.411	159	3.83	10504	0.001808	0.0347	3.25	0.0040	1.1920	0.972

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

7500.000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM	ISOCHORE	INTERNAL	ENTHALPY	ENTROPY	C _v	C _p	VELOCITY
DEG. R	CU FT/LB	DERIVATIVE	DERIVATIVE	ENERGY	BTU/LB	BTU/LB-R	BTU / LB -R		OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB					FT/SEC
* 108.120	0.01199	2533	321	-81.91	-65.26	0.5121	0.270	0.386	4101
110	0.01203	2501	316	-81.23	-64.53	0.5188	0.268	0.386	4084
120	0.01221	2339	294	-77.64	-60.68	0.5523	0.262	0.384	3987
130	0.01240	2187	273	-74.07	-56.85	0.5830	0.256	0.382	3889
140	0.01260	2044	254	-70.53	-53.04	0.6112	0.251	0.380	3789
150	0.01279	1911	236	-67.01	-49.24	0.6374	0.246	0.378	3689
160	0.01300	1786	219	-63.52	-45.47	0.6618	0.242	0.376	3590
170	0.01321	1670	204	-60.06	-41.71	0.6845	0.238	0.375	3492
180	0.01343	1561	190	-56.62	-37.98	0.7059	0.234	0.372	3396
190	0.01365	1460	177	-53.22	-34.26	0.7260	0.230	0.370	3304
200	0.01388	1365	165	-49.84	-30.57	0.7449	0.225	0.368	3216
210	0.01412	1277	155	-46.50	-26.90	0.7628	0.220	0.365	3134
220	0.01436	1195	145	-43.20	-23.26	0.7798	0.214	0.362	3059
230	0.01462	1119	136	-39.95	-19.65	0.7958	0.208	0.359	2993
240	0.01488	1047	128	-36.69	-16.02	0.8112	0.210	0.365	2904
250	0.01516	980	121	-33.41	-12.35	0.8262	0.209	0.368	2833
260	0.01546	910	114	-30.08	-8.61	0.8409	0.207	0.371	2752
270	0.01576	889	107	-26.83	-4.95	0.8547	0.205	0.364	2705
280	0.01606	839	100	-23.64	-1.34	0.8678	0.202	0.361	2634
290	0.01637	800	93	-20.45	2.28	0.8805	0.204	0.361	2561
300	0.01671	697	87	-17.24	5.96	0.8930	0.201	0.370	2437
310	0.01705	668	81	-14.09	9.58	0.9049	0.200	0.365	2380
320	0.01740	606	77	-10.97	13.19	0.9163	0.199	0.374	2298
330	0.01777	628	73	-7.80	16.88	0.9277	0.198	0.360	2303
340	0.01816	577	69	-4.68	20.55	0.9386	0.196	0.366	2234
350	0.01857	532	65	-1.54	24.25	0.9494	0.195	0.371	2168
360	0.01899	533	61	1.53	27.90	0.9596	0.193	0.360	2147
370	0.01939	489	57	4.50	31.43	0.9693	0.191	0.363	2076
380	0.01983	488	54	7.48	35.01	0.9789	0.189	0.354	2057
390	0.02027	468	51	10.39	38.54	0.9880	0.187	0.351	2016
400	0.02072	452	48	13.27	42.04	0.9969	0.185	0.348	1983
410	0.02118	450	45	16.08	45.49	1.0054	0.183	0.339	1963
420	0.02165	429	43	18.84	48.90	1.0136	0.182	0.337	1923
430	0.02213	421	41	21.55	52.28	1.0216	0.180	0.332	1898
440	0.02262	395	39	24.23	55.65	1.0293	0.178	0.335	1854
450	0.02313	399	37	26.87	58.98	1.0368	0.177	0.326	1846
460	0.02373	296	36	29.61	62.56	1.0447	0.175	0.384	1731
470	0.02431	370	35	32.33	66.08	1.0522	0.175	0.341	1830
480	0.02484	398	33	34.91	69.40	1.0592	0.174	0.324	1853
490	0.02536	397	31	37.43	72.65	1.0659	0.173	0.318	1837
500	0.02587	352	30	39.88	75.82	1.0723	0.172	0.331	1768
510	0.02646	367	29	42.40	79.16	1.0789	0.172	0.320	1782
520	0.02697	383	28	44.77	82.23	1.0849	0.171	0.310	1794
530	0.02755	346	27	47.20	85.46	1.0910	0.170	0.322	1742
540	0.02814	331	26	49.59	88.67	1.0970	0.169	0.327	1721
550	0.02876	370	25	52.00	91.94	1.1030	0.168	0.308	1772
560	0.02923	385	24	54.27	94.94	1.1085	0.167	0.299	1784
570	0.02984	380	23	56.52	97.96	1.1138	0.167	0.296	1771
580	0.03037	363	22	58.72	100.90	1.1189	0.166	0.298	1741
590	0.03091	376	21	60.88	103.81	1.1239	0.165	0.291	1753
600	0.03146	370	21	63.04	106.74	1.1288	0.164	0.289	1741

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

7500.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(OP/DU)	-V(OP/DV)	-(OV/DT)/V	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R ¹	BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	SQ FT/HR		
* 108.120	83.390	255	14.26	211224	0.001518	0.1154	52.82	0.0036	1.5834	6.366
110	83.153	254	14.18	207986	0.001520	0.1150	51.20	0.0036	1.5815	6.184
120	81.892	250	13.71	191539	0.001534	0.1129	43.46	0.0036	1.5713	5.324
130	80.640	247	13.22	176336	0.001548	0.1105	37.07	0.0036	1.5612	4.615
140	79.395	243	12.74	162299	0.001563	0.1080	31.79	0.0036	1.5513	4.030
150	78.158	240	12.26	149349	0.001579	0.1053	27.40	0.0036	1.5414	3.545
160	76.927	236	11.79	137412	0.001595	0.1025	23.76	0.0035	1.5317	3.141
170	75.703	232	11.34	126414	0.001614	0.0997	20.73	0.0035	1.5220	2.805
180	74.484	228	10.92	116288	0.001634	0.0968	18.21	0.0035	1.5124	2.523
190	73.269	224	10.53	106967	0.001656	0.0939	16.10	0.0035	1.5029	2.287
200	72.057	219	10.20	98389	0.001681	0.0910	14.33	0.0034	1.4934	2.088
210	70.846	214	9.92	90493	0.001710	0.0881	12.84	0.0034	1.4840	1.919
220	69.633	208	9.71	83223	0.001743	0.0852	11.59	0.0034	1.4746	1.776
230	68.417	201	9.60	76529	0.001781	0.0823	10.53	0.0034	1.4652	1.652
240	67.195	200	9.11	70361	0.001825	0.0795	9.63	0.0032	1.4559	1.592
250	65.963	196	8.82	64677	0.001877	0.0767	8.87	0.0032	1.4464	1.532
260	64.681	191	8.54	58855	0.001938	0.0739	8.19	0.0031	1.4367	1.480
270	63.471	192	8.22	56397	0.001892	0.0714	7.66	0.0031	1.4275	1.404
280	62.283	189	7.92	52272	0.001909	0.0689	7.21	0.0031	1.4186	1.358
290	61.087	189	7.49	48892	0.001911	0.0666	6.82	0.0030	1.4096	1.330
300	59.859	177	7.24	41709	0.002089	0.0643	6.47	0.0029	1.4004	1.341
310	58.666	176	6.95	39208	0.002078	0.0621	6.18	0.0029	1.3915	1.310
320	57.484	169	6.73	34824	0.002208	0.0601	5.97	0.0028	1.3827	1.336
330	56.260	175	6.54	35333	0.002058	0.0580	5.77	0.0029	1.3737	1.290
340	55.061	169	6.36	31765	0.002165	0.0561	5.59	0.0028	1.3649	1.314
350	53.846	164	6.18	28657	0.002261	0.0543	5.42	0.0027	1.3560	1.332
360	52.673	166	5.99	28087	0.002167	0.0527	5.25	0.0028	1.3474	1.293
370	51.574	160	5.80	25243	0.002265	0.0512	5.11	0.0027	1.3395	1.304
380	50.441	162	5.65	24613	0.002191	0.0498	4.96	0.0028	1.3313	1.271
390	49.346	159	5.51	23077	0.002204	0.0485	4.83	0.0028	1.3234	1.259
400	48.265	158	5.37	21823	0.002202	0.0472	4.70	0.0028	1.3156	1.245
410	47.217	159	5.24	21242	0.002134	0.0461	4.58	0.0029	1.3082	1.212
420	46.195	156	5.11	19840	0.002160	0.0451	4.47	0.0029	1.3009	1.204
430	45.197	156	4.99	19031	0.002130	0.0442	4.37	0.0029	1.2938	1.183
440	44.205	152	4.89	17454	0.002207	0.0433	4.27	0.0029	1.2868	1.190
450	43.241	154	4.78	17234	0.002121	0.0424	4.18	0.0030	1.2800	1.156
460	42.149	133	4.85	12469	0.002874	0.0415	4.07	0.0026	1.2724	1.354
470	41.140	150	4.82	15238	0.002271	0.0407	3.98	0.0029	1.2653	1.200
480	40.262	157	4.71	16040	0.002056	0.0401	3.91	0.0031	1.2592	1.135
490	39.434	159	4.59	15658	0.002002	0.0395	3.84	0.0032	1.2535	1.111
500	38.651	150	4.50	13605	0.002202	0.0391	3.78	0.0031	1.2480	1.152
510	37.790	155	4.43	13886	0.002069	0.0385	3.72	0.0032	1.2421	1.112
520	37.080	160	4.35	14199	0.001942	0.0381	3.67	0.0033	1.2372	1.073
530	36.299	152	4.30	12559	0.002114	0.0377	3.61	0.0032	1.2319	1.111
540	35.543	150	4.27	11758	0.002185	0.0373	3.56	0.0032	1.2267	1.125
550	34.776	160	4.24	12876	0.001926	0.0369	3.51	0.0034	1.2215	1.057
560	34.146	165	4.17	13130	0.001816	0.0366	3.48	0.0036	1.2172	1.023
570	33.518	165	4.11	12753	0.001797	0.0363	3.44	0.0037	1.2129	1.011
580	32.926	162	4.04	11964	0.001843	0.0361	3.41	0.0037	1.2089	1.015
590	32.357	166	4.00	12156	0.001753	0.0359	3.38	0.0038	1.2051	0.987
600	31.782	165	3.95	11761	0.001748	0.0357	3.36	0.0039	1.2012	0.979

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

8000.000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM	ISOCORE	INTERNAL	ENTHALPY	ENTROPY	C _v	C _p	VELOCITY
DEG. R	CU FT/LB	DERIVATIVE	DERIVATIVE	ENERGY	BTU/LB	BTU/LB-R	BTU / LB -R	-R	OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB					FT/SEC
* 108.779	0.01198	2561	321	-81.82	-64.08	0.5128	0.270	0.386	4119
110	0.01200	2540	318	-81.38	-63.60	0.5171	0.269	0.386	4107
120	0.01218	2379	295	-77.80	-59.76	0.5506	0.263	0.384	4012
130	0.01237	2227	275	-74.25	-55.93	0.5812	0.257	0.382	3915
140	0.01256	2085	255	-70.73	-52.12	0.6094	0.252	0.380	3817
150	0.01275	1952	238	-67.23	-48.34	0.6356	0.247	0.378	3718
160	0.01295	1828	221	-63.76	-44.57	0.6599	0.243	0.376	3620
170	0.01316	1712	206	-60.31	-40.82	0.6826	0.239	0.374	3523
180	0.01337	1604	192	-56.90	-37.10	0.7039	0.235	0.371	3429
190	0.01359	1503	179	-53.52	-33.39	0.7239	0.231	0.369	3338
200	0.01381	1409	167	-50.17	-29.71	0.7428	0.226	0.367	3252
210	0.01404	1321	157	-46.86	-26.06	0.7606	0.221	0.364	3171
220	0.01428	1239	147	-43.58	-22.43	0.7775	0.216	0.361	3098
230	0.01452	1162	138	-40.36	-18.84	0.7934	0.209	0.357	3034
240	0.01478	1091	131	-37.13	-15.24	0.8088	0.211	0.362	2948
250	0.01505	1024	124	-33.89	-11.60	0.8236	0.209	0.365	2879
260	0.01533	1008	117	-30.60	-7.88	0.8382	0.208	0.360	2847
270	0.01562	956	109	-27.39	-4.26	0.8519	0.206	0.358	2779
280	0.01591	839	102	-24.18	-0.61	0.8652	0.203	0.367	2649
290	0.01621	800	96	-21.03	2.98	0.8777	0.205	0.367	2577
300	0.01652	774	90	-17.89	6.59	0.8900	0.202	0.361	2528
310	0.01684	735	84	-14.78	10.16	0.9017	0.201	0.358	2463
320	0.01717	705	79	-11.70	13.73	0.9130	0.200	0.354	2406
330	0.01752	625	75	-8.58	17.38	0.9242	0.199	0.369	2319
340	0.01789	577	71	-5.49	21.01	0.9351	0.197	0.373	2246
350	0.01827	575	67	-2.39	24.68	0.9457	0.196	0.366	2232
360	0.01866	561	64	0.64	28.28	0.9559	0.194	0.361	2200
370	0.01905	566	60	3.63	31.85	0.9656	0.192	0.350	2184
380	0.01944	513	56	6.53	35.33	0.9749	0.190	0.355	2107
390	0.01985	514	53	9.43	38.84	0.9840	0.188	0.346	2091
400	0.02027	491	50	12.27	42.30	0.9928	0.186	0.344	2049
410	0.02070	474	48	15.07	45.74	1.0013	0.185	0.341	2015
420	0.02113	473	45	17.82	49.13	1.0094	0.183	0.333	1998
430	0.02157	450	43	20.51	52.47	1.0173	0.181	0.333	1956
440	0.02202	441	41	23.16	55.79	1.0249	0.180	0.328	1931
450	0.02248	412	39	25.77	59.07	1.0323	0.178	0.331	1884
460	0.02297	416	37	28.38	62.41	1.0397	0.177	0.323	1878
470	0.02342	295	36	30.87	65.56	1.0464	0.175	0.381	1722
480	0.02407	384	35	33.68	69.34	1.0544	0.174	0.340	1862
490	0.02459	417	34	36.27	72.70	1.0613	0.174	0.323	1895
500	0.02510	416	32	38.78	75.96	1.0679	0.173	0.317	1879
510	0.02554	435	31	41.14	78.97	1.0739	0.172	0.305	1890
520	0.02605	373	29	43.56	82.14	1.0800	0.171	0.322	1812
530	0.02658	398	28	45.99	85.37	1.0862	0.171	0.310	1832
540	0.02706	414	27	48.29	88.37	1.0918	0.170	0.301	1844
550	0.02761	369	26	50.66	91.56	1.0976	0.169	0.315	1785
560	0.02816	351	26	53.00	94.72	1.1033	0.168	0.321	1762
570	0.02875	399	25	55.35	97.93	1.1090	0.167	0.301	1823
580	0.02924	413	24	57.55	100.86	1.1141	0.166	0.292	1835
590	0.02975	408	23	59.75	103.82	1.1191	0.165	0.290	1822
600	0.03022	422	22	61.87	106.64	1.1239	0.164	0.283	1833

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

8000.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	-V(DP/DV)	-(DV/DT)/V	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R ¹	BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	SQ FT/HR		
* 108.773	83.504	257	14.23	213847	0.001500	0.1156	53.62	0.0036	1.5843	6.441
110	83.351	257	14.18	211749	0.001501	0.1154	52.55	0.0036	1.5831	6.321
120	82.104	254	13.70	195302	0.001513	0.1133	44.67	0.0036	1.5730	5.444
130	80.866	250	13.22	180096	0.001525	0.1110	38.15	0.0036	1.5631	4.721
140	79.637	247	12.74	166053	0.001538	0.1085	32.75	0.0036	1.5532	4.123
150	78.417	243	12.25	153093	0.001551	0.1059	28.26	0.0036	1.5435	3.627
160	77.204	240	11.79	141143	0.001566	0.1032	24.53	0.0036	1.5339	3.214
170	75.999	236	11.34	130128	0.001581	0.1004	21.42	0.0035	1.5243	2.869
180	74.800	232	10.92	119981	0.001599	0.0976	18.83	0.0035	1.5149	2.580
190	73.607	228	10.54	110635	0.001618	0.0948	16.66	0.0035	1.5055	2.336
200	72.417	224	10.21	102025	0.001640	0.0919	14.83	0.0035	1.4962	2.130
210	71.231	219	9.94	94094	0.001665	0.0891	13.30	0.0034	1.4870	1.956
220	70.044	213	9.74	86784	0.001695	0.0862	12.00	0.0034	1.4778	1.806
230	68.856	206	9.63	80044	0.001729	0.0835	10.90	0.0034	1.4686	1.677
240	67.663	205	9.15	73825	0.001768	0.0807	9.97	0.0033	1.4594	1.612
250	66.462	201	8.88	68082	0.001814	0.0780	9.17	0.0032	1.4503	1.547
260	65.216	203	8.61	65726	0.001774	0.0752	8.47	0.0032	1.4408	1.461
270	64.041	200	8.31	61232	0.001787	0.0727	7.91	0.0032	1.4318	1.404
280	62.844	189	8.00	52743	0.001939	0.0702	7.42	0.0030	1.4228	1.397
290	61.688	189	7.58	49373	0.001942	0.0679	7.02	0.0030	1.4141	1.367
300	60.531	188	7.34	46837	0.001919	0.0657	6.67	0.0030	1.4054	1.318
310	59.391	186	7.05	43670	0.001928	0.0636	6.37	0.0030	1.3969	1.291
320	58.251	184	6.78	41047	0.001924	0.0616	6.11	0.0030	1.3884	1.266
330	57.063	175	6.64	35656	0.002112	0.0595	5.92	0.0028	1.3796	1.320
340	55.903	170	6.42	32250	0.002196	0.0577	5.74	0.0028	1.3711	1.334
350	54.723	171	6.28	31445	0.002140	0.0558	5.56	0.0028	1.3624	1.314
360	53.599	171	6.12	30068	0.002116	0.0542	5.40	0.0028	1.3542	1.297
370	52.496	173	5.93	29697	0.002015	0.0527	5.25	0.0029	1.3462	1.255
380	51.443	166	5.76	26411	0.002136	0.0513	5.11	0.0028	1.3385	1.275
390	50.370	168	5.63	25876	0.002062	0.0499	4.98	0.0029	1.3308	1.242
400	49.333	165	5.49	24223	0.002083	0.0487	4.85	0.0029	1.3233	1.234
410	48.309	164	5.36	22903	0.002087	0.0476	4.73	0.0029	1.3160	1.222
420	47.316	165	5.23	22368	0.002022	0.0465	4.62	0.0030	1.3089	1.191
430	46.354	162	5.10	20851	0.002056	0.0456	4.52	0.0030	1.3020	1.187
440	45.406	161	4.99	20024	0.002031	0.0447	4.42	0.0030	1.2953	1.168
450	44.484	157	4.88	18310	0.002114	0.0438	4.33	0.0030	1.2888	1.178
460	43.529	159	4.79	18125	0.002031	0.0430	4.23	0.0031	1.2820	1.145
470	42.699	135	4.75	12588	0.002828	0.0423	4.16	0.0026	1.2762	1.345
480	41.547	154	4.85	15973	0.002199	0.0414	4.05	0.0029	1.2681	1.196
490	40.661	163	4.77	16969	0.001984	0.0407	3.97	0.0031	1.2620	1.133
500	39.839	164	4.65	16575	0.001933	0.0402	3.90	0.0032	1.2563	1.109
510	39.158	170	4.55	17038	0.001800	0.0398	3.85	0.0033	1.2515	1.066
520	38.394	158	4.48	14505	0.002033	0.0393	3.80	0.0032	1.2463	1.119
530	37.616	164	4.41	14987	0.001890	0.0388	3.74	0.0033	1.2409	1.076
540	36.960	169	4.34	15297	0.001781	0.0385	3.70	0.0035	1.2364	1.041
550	36.220	160	4.31	13355	0.001972	0.0381	3.65	0.0033	1.2313	1.086
560	35.509	156	4.28	12450	0.002052	0.0377	3.60	0.0033	1.2265	1.104
570	34.787	169	4.25	13872	0.001782	0.0374	3.56	0.0036	1.2215	1.030
580	34.203	173	4.19	14127	0.001687	0.0371	3.52	0.0037	1.2176	1.000
590	33.616	173	4.13	13719	0.001673	0.0369	3.49	0.0038	1.2136	0.989
600	33.089	178	4.08	13961	0.001588	0.0367	3.47	0.0039	1.2100	0.961

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

8500.000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM	ISOCHORE	INTERNAL	ENTHALPY	ENTROPY	C _v	C _p	VELOCITY
DEG. R	CU FT/LB	DERIVATIVE	DERIVATIVE	ENERGY	BTU/LB	BTU/LB-R	BTU / LB -R		OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB					FT/SEC
* 109.435	0.01196	2589	321	-81.72	-62.90	0.5135	0.270	0.385	4136
110	0.01197	2579	319	-81.52	-62.68	0.5155	0.270	0.385	4131
120	0.01215	2418	297	-77.96	-58.84	0.5489	0.263	0.383	4037
130	0.01233	2267	276	-74.42	-55.01	0.5795	0.258	0.381	3940
140	0.01252	2126	257	-70.92	-51.21	0.6077	0.253	0.379	3843
150	0.01271	1993	239	-67.44	-47.43	0.6337	0.248	0.377	3746
160	0.01291	1870	223	-63.99	-43.67	0.6580	0.244	0.375	3649
170	0.01311	1754	208	-60.56	-39.93	0.6807	0.240	0.373	3553
180	0.01331	1646	194	-57.17	-36.21	0.7019	0.236	0.371	3460
190	0.01353	1546	181	-53.81	-32.52	0.7219	0.232	0.368	3371
200	0.01374	1452	169	-50.48	-28.85	0.7407	0.228	0.365	3286
210	0.01397	1364	159	-47.19	-25.21	0.7585	0.223	0.362	3208
220	0.01420	1282	149	-43.95	-21.60	0.7753	0.217	0.359	3136
230	0.01443	1206	140	-40.75	-18.03	0.7912	0.210	0.355	3073
240	0.01468	1134	133	-37.55	-14.44	0.8064	0.212	0.360	2989
250	0.01494	1067	126	-34.35	-10.83	0.8212	0.210	0.363	2922
260	0.01522	1008	119	-31.06	-7.10	0.8358	0.209	0.365	2859
270	0.01549	956	112	-27.88	-3.50	0.8494	0.207	0.363	2791
280	0.01577	937	105	-24.73	0.09	0.8624	0.204	0.356	2749
290	0.01605	883	98	-21.62	3.65	0.8749	0.206	0.358	2666
300	0.01635	841	93	-18.50	7.23	0.8871	0.203	0.354	2606
310	0.01665	815	87	-15.42	10.78	0.8987	0.202	0.349	2554
320	0.01696	773	82	-12.37	14.33	0.9099	0.201	0.348	2488
330	0.01728	625	77	-9.34	17.86	0.9208	0.200	0.372	2320
340	0.01765	663	73	-6.20	21.59	0.9319	0.198	0.358	2354
350	0.01799	601	69	-3.21	25.11	0.9422	0.197	0.365	2272
360	0.01836	603	66	-0.18	28.73	0.9523	0.195	0.358	2263
370	0.01873	589	63	2.79	32.27	0.9621	0.193	0.353	2233
380	0.01910	598	59	5.69	35.76	0.9714	0.191	0.340	2220
390	0.01948	537	56	8.54	39.20	0.9803	0.189	0.348	2137
400	0.01988	539	53	11.37	42.65	0.9890	0.188	0.339	2125
410	0.02027	514	50	14.14	46.05	0.9974	0.186	0.338	2081
420	0.02068	496	48	16.87	49.42	1.0055	0.184	0.336	2047
430	0.02109	496	45	19.56	52.76	1.0134	0.182	0.328	2032
440	0.02150	470	43	22.19	56.03	1.0209	0.181	0.328	1987
450	0.02193	461	41	24.79	59.30	1.0283	0.179	0.324	1963
460	0.02235	428	39	27.32	62.49	1.0353	0.178	0.328	1912
470	0.02285	434	37	29.93	65.89	1.0426	0.177	0.320	1909
480	0.02322	452	36	32.31	68.86	1.0488	0.175	0.309	1921
490	0.02384	398	36	35.06	72.59	1.0565	0.174	0.338	1893
500	0.02436	412	34	37.63	75.97	1.0633	0.174	0.330	1906
510	0.02482	455	33	40.08	79.15	1.0696	0.173	0.311	1947
520	0.02528	454	31	42.49	82.28	1.0757	0.172	0.305	1932
530	0.02569	390	30	44.78	85.22	1.0813	0.171	0.321	1842
540	0.02620	403	29	47.18	88.41	1.0873	0.170	0.314	1855
550	0.02669	429	28	49.52	91.53	1.0930	0.170	0.302	1881
560	0.02716	380	27	51.80	94.55	1.0984	0.169	0.315	1813
570	0.02766	391	26	54.08	97.62	1.1039	0.168	0.309	1827
580	0.02818	370	25	56.37	100.72	1.1093	0.167	0.316	1802
590	0.02873	427	25	58.66	103.89	1.1147	0.166	0.294	1873
600	0.02919	442	24	60.82	106.76	1.1195	0.165	0.286	1885

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

8500.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	-V(DP/DV)	-(DV/DT)/V	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R	BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	SQ FT/HR		
* 109.435	83.616	260	14.20	216460	0.001482	0.1159	54.43	0.0036	1.5852	6.516
110	83.546	260	14.17	215492	0.001482	0.1158	53.93	0.0036	1.5846	6.460
120	82.313	257	13.70	199042	0.001493	0.1137	45.90	0.0036	1.5747	5.566
130	81.089	254	13.22	183832	0.001503	0.1115	39.24	0.0036	1.5648	4.828
140	79.875	250	12.73	169780	0.001514	0.1091	33.72	0.0036	1.5551	4.218
150	78.670	247	12.25	156809	0.001526	0.1066	29.13	0.0036	1.5455	3.711
160	77.474	244	11.78	144844	0.001538	0.1039	25.31	0.0036	1.5360	3.288
170	76.287	240	11.34	133811	0.001551	0.1012	22.13	0.0036	1.5266	2.935
180	75.108	237	10.92	123641	0.001566	0.0984	19.46	0.0035	1.5173	2.637
190	73.935	233	10.54	114268	0.001583	0.0956	17.22	0.0035	1.5081	2.387
200	72.767	228	10.22	105627	0.001602	0.0928	15.35	0.0035	1.4990	2.175
210	71.603	223	9.95	97659	0.001624	0.0901	13.76	0.0035	1.4899	1.994
220	70.441	218	9.76	90308	0.001650	0.0873	12.42	0.0035	1.4809	1.838
230	69.278	211	9.66	83521	0.001680	0.0846	11.28	0.0034	1.4719	1.704
240	68.112	210	9.19	77250	0.001716	0.0818	10.31	0.0033	1.4629	1.634
250	66.940	206	8.93	71450	0.001757	0.0792	9.49	0.0033	1.4539	1.564
260	65.688	203	8.68	66202	0.001797	0.0764	8.73	0.0032	1.4444	1.504
270	64.550	201	8.38	61719	0.001811	0.0739	8.16	0.0032	1.4357	1.444
280	63.411	202	8.09	59388	0.001767	0.0715	7.66	0.0032	1.4271	1.373
290	62.292	200	7.66	54999	0.001790	0.0693	7.24	0.0031	1.4186	1.348
300	61.171	197	7.44	51469	0.001798	0.0671	6.87	0.0031	1.4102	1.308
310	60.065	197	7.15	48949	0.001774	0.0650	6.56	0.0031	1.4019	1.269
320	58.965	194	6.87	45593	0.001788	0.0630	6.28	0.0031	1.3937	1.249
330	57.865	175	6.63	36157	0.002122	0.0611	6.06	0.0028	1.3856	1.328
340	56.649	183	6.53	37562	0.001954	0.0590	5.87	0.0029	1.3766	1.280
350	55.577	176	6.35	33391	0.002078	0.0573	5.71	0.0028	1.3687	1.308
360	54.453	178	6.22	32825	0.002011	0.0556	5.54	0.0029	1.3604	1.282
370	53.378	177	6.06	31450	0.001988	0.0541	5.39	0.0029	1.3526	1.266
380	52.343	181	5.88	31312	0.001881	0.0527	5.25	0.0030	1.3451	1.221
390	51.331	172	5.73	27546	0.002023	0.0514	5.12	0.0029	1.3377	1.249
400	50.314	174	5.60	27136	0.001946	0.0501	4.99	0.0029	1.3304	1.215
410	49.328	171	5.46	25358	0.001974	0.0490	4.87	0.0029	1.3233	1.211
420	48.356	169	5.34	23975	0.001983	0.0479	4.76	0.0029	1.3163	1.202
430	47.412	171	5.22	23493	0.001921	0.0469	4.66	0.0030	1.3095	1.172
440	46.504	167	5.09	21852	0.001962	0.0460	4.56	0.0030	1.3031	1.171
450	45.600	167	4.98	21017	0.001940	0.0451	4.46	0.0031	1.2967	1.153
460	44.747	162	4.88	19150	0.002030	0.0444	4.38	0.0030	1.2906	1.166
470	43.773	164	4.79	19006	0.001947	0.0435	4.28	0.0031	1.2838	1.134
480	43.059	169	4.70	19455	0.001825	0.0430	4.22	0.0032	1.2787	1.093
490	41.938	159	4.87	16705	0.002130	0.0420	4.11	0.0030	1.2709	1.191
500	41.054	163	4.81	16911	0.002028	0.0414	4.04	0.0031	1.2647	1.160
510	40.292	174	4.72	18345	0.001790	0.0409	3.97	0.0033	1.2594	1.088
520	39.557	175	4.61	17967	0.001745	0.0404	3.92	0.0033	1.2543	1.066
530	38.928	162	4.51	15198	0.001979	0.0400	3.87	0.0032	1.2500	1.120
540	38.174	166	4.47	15383	0.001889	0.0396	3.82	0.0033	1.2448	1.091
550	37.472	174	4.40	16089	0.001738	0.0392	3.77	0.0035	1.2399	1.045
560	36.817	163	4.34	13990	0.001926	0.0388	3.72	0.0034	1.2354	1.087
570	36.156	167	4.31	14146	0.001848	0.0385	3.68	0.0034	1.2309	1.063
580	35.485	163	4.29	13145	0.001933	0.0382	3.64	0.0034	1.2263	1.083
590	34.802	177	4.27	14870	0.001657	0.0378	3.60	0.0037	1.2216	1.007
600	34.258	182	4.21	15126	0.001574	0.0376	3.57	0.0038	1.2179	0.979

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

9000.000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM	ISOCHORE	INTERNAL	ENTHALPY	ENTROPY	C _v	C _p	VELOCITY
DEG. R	CU FT/LB	DERIVATIVE CU FT-PSIA/LB	DERIVATIVE PSIA/R	ENERGY BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		OF SOUND FT/SEC
* 110.088	0.01194	2616	321	-81.62	-61.72	0.5141	0.270	0.385	4153
120	0.01212	2457	299	-78.11	-57.91	0.5472	0.264	0.383	4061
130	0.01230	2307	278	-74.59	-54.09	0.5778	0.259	0.381	3965
140	0.01248	2166	259	-71.10	-50.30	0.6059	0.254	0.379	3869
150	0.01267	2034	241	-67.64	-46.52	0.6320	0.249	0.376	3773
160	0.01286	1910	224	-64.21	-42.77	0.6562	0.245	0.374	3677
170	0.01306	1795	209	-60.80	-39.04	0.6788	0.241	0.372	3583
180	0.01326	1688	195	-57.43	-35.33	0.7000	0.237	0.370	3491
190	0.01347	1587	183	-54.09	-31.64	0.7199	0.233	0.367	3403
200	0.01368	1494	171	-50.78	-27.98	0.7387	0.229	0.364	3320
210	0.01390	1406	160	-47.51	-24.36	0.7564	0.224	0.361	3243
220	0.01412	1324	151	-44.29	-20.76	0.7731	0.218	0.357	3172
230	0.01435	1248	142	-41.12	-17.20	0.7889	0.211	0.353	3111
240	0.01459	1176	134	-37.95	-13.64	0.8041	0.213	0.358	3029
250	0.01484	1110	127	-34.78	-10.05	0.8188	0.211	0.360	2963
260	0.01510	1047	121	-31.59	-6.43	0.8330	0.209	0.364	2902
270	0.01537	1056	114	-28.38	-2.77	0.8468	0.208	0.353	2886
280	0.01564	1001	108	-25.25	0.81	0.8598	0.206	0.352	2818
290	0.01592	883	101	-22.13	4.40	0.8724	0.207	0.364	2680
300	0.01620	841	95	-19.04	7.95	0.8844	0.204	0.360	2621
310	0.01649	815	89	-15.97	11.50	0.8961	0.203	0.356	2570
320	0.01678	773	84	-12.95	15.01	0.9072	0.202	0.354	2504
330	0.01709	740	79	-9.94	18.53	0.9180	0.201	0.351	2448
340	0.01740	641	75	-6.96	22.04	0.9285	0.199	0.368	2340
350	0.01775	698	72	-3.92	25.66	0.9390	0.198	0.348	2385
360	0.01809	624	68	-0.96	29.19	0.9489	0.196	0.358	2298
370	0.01845	630	65	2.00	32.74	0.9587	0.194	0.350	2293
380	0.01880	617	62	4.90	36.24	0.9680	0.192	0.345	2265
390	0.01915	631	58	7.72	39.64	0.9768	0.190	0.332	2256
400	0.01952	560	55	10.52	43.04	0.9854	0.189	0.342	2167
410	0.01989	565	52	13.28	46.43	0.9938	0.187	0.332	2157
420	0.02027	537	50	15.99	49.77	1.0019	0.185	0.332	2112
430	0.02066	517	47	18.67	53.09	1.0097	0.184	0.331	2078
440	0.02105	518	45	21.30	56.38	1.0172	0.182	0.323	2064
450	0.02144	490	43	23.87	59.59	1.0244	0.181	0.324	2018
460	0.02184	481	41	26.42	62.83	1.0316	0.179	0.320	1995
470	0.02222	500	39	28.88	65.91	1.0382	0.178	0.309	2006
480	0.02264	460	37	31.37	69.10	1.0449	0.177	0.315	1951
490	0.02307	469	36	33.82	72.27	1.0514	0.175	0.307	1951
500	0.02354	282	35	36.31	75.54	1.0580	0.174	0.399	1730
510	0.02414	425	35	39.01	79.23	1.0653	0.173	0.329	1935
520	0.02460	474	33	41.48	82.48	1.0717	0.173	0.310	1987
530	0.02501	493	32	43.82	85.50	1.0774	0.172	0.300	1997
540	0.02543	493	31	46.14	88.53	1.0831	0.171	0.295	1984
550	0.02585	415	30	48.42	91.49	1.0885	0.170	0.314	1884
560	0.02632	428	29	50.75	94.62	1.0941	0.169	0.308	1897
570	0.02677	460	28	53.01	97.63	1.0995	0.168	0.294	1929
580	0.02723	403	27	55.25	100.62	1.1047	0.167	0.309	1853
590	0.02770	414	26	57.47	103.63	1.1098	0.167	0.303	1868
600	0.02819	390	25	59.71	106.69	1.1150	0.166	0.310	1840

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

9000.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(OP/DOU)	-V(OP/DV)	-(DV/DT)/V	THERMAL	VISCOSITY	THERMAL	DIELECTRIC	PRANDTL
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R	CONDUCTIVITY BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	DIFFUSIVITY SQ FT/HR	CONSTANT	NUMBER
* 110.088	83.728	263	14.17	219063	0.001464	0.1161	55.25	0.0036	1.5861	6.593
120	82.518	260	13.70	202760	0.001473	0.1141	47.14	0.0036	1.5763	5.690
130	81.308	257	13.21	187544	0.001482	0.1120	40.35	0.0036	1.5666	4.938
140	80.108	254	12.73	173483	0.001491	0.1096	34.71	0.0036	1.5570	4.315
150	78.918	251	12.25	160499	0.001501	0.1072	30.02	0.0036	1.5475	3.797
160	77.739	248	11.78	148518	0.001511	0.1046	26.11	0.0036	1.5381	3.364
170	76.569	244	11.34	137465	0.001522	0.1019	22.84	0.0036	1.5288	3.002
180	75.408	241	10.92	127271	0.001535	0.0992	20.10	0.0036	1.5197	2.697
190	74.254	237	10.55	117869	0.001549	0.0965	17.80	0.0035	1.5106	2.439
200	73.106	233	10.22	109195	0.001566	0.0937	15.87	0.0035	1.5016	2.220
210	71.964	228	9.96	101190	0.001585	0.0910	14.23	0.0035	1.4927	2.033
220	70.824	222	9.77	93797	0.001608	0.0883	12.85	0.0035	1.4838	1.872
230	69.686	216	9.68	86963	0.001635	0.0856	11.67	0.0035	1.4750	1.731
240	68.545	215	9.22	80640	0.001667	0.0830	10.67	0.0034	1.4662	1.657
250	67.399	211	8.97	74783	0.001705	0.0803	9.81	0.0033	1.4574	1.582
260	66.246	208	8.75	69352	0.001749	0.0777	9.07	0.0032	1.4486	1.527
270	65.070	213	8.45	68738	0.001661	0.0752	8.42	0.0033	1.4397	1.425
280	63.954	210	8.18	64025	0.001679	0.0728	7.90	0.0032	1.4312	1.375
290	62.827	200	7.74	55471	0.001817	0.0705	7.44	0.0031	1.4227	1.383
300	61.741	197	7.51	51949	0.001826	0.0683	7.06	0.0031	1.4145	1.341
310	60.653	197	7.24	49429	0.001805	0.0662	6.73	0.0031	1.4063	1.302
320	59.592	195	6.96	46078	0.001821	0.0643	6.45	0.0030	1.3984	1.280
330	58.522	193	6.71	43332	0.001822	0.0624	6.20	0.0030	1.3904	1.257
340	57.458	180	6.56	36854	0.002040	0.0606	6.01	0.0029	1.3826	1.314
350	56.339	191	6.43	39319	0.001822	0.0587	5.84	0.0030	1.3743	1.245
360	55.277	181	6.29	34466	0.001977	0.0571	5.68	0.0029	1.3665	1.284
370	54.209	184	6.16	34165	0.001898	0.0555	5.53	0.0029	1.3587	1.254
380	53.182	184	6.02	32829	0.001874	0.0540	5.38	0.0029	1.3512	1.237
390	52.211	188	5.83	32938	0.001761	0.0527	5.26	0.0030	1.3441	1.190
400	51.234	178	5.70	28669	0.001921	0.0515	5.13	0.0029	1.3370	1.225
410	50.268	180	5.57	28389	0.001842	0.0503	5.01	0.0030	1.3300	1.191
420	49.330	177	5.44	26485	0.001876	0.0492	4.90	0.0030	1.3233	1.190
430	48.406	175	5.32	25041	0.001890	0.0482	4.79	0.0030	1.3167	1.183
440	47.504	177	5.20	24614	0.001829	0.0473	4.69	0.0031	1.3102	1.155
450	46.648	173	5.08	22852	0.001875	0.0464	4.60	0.0031	1.3041	1.156
460	45.779	173	4.98	22000	0.001856	0.0456	4.51	0.0031	1.2979	1.140
470	45.001	178	4.87	22510	0.001734	0.0449	4.43	0.0032	1.2924	1.098
480	44.163	171	4.79	20328	0.001841	0.0442	4.35	0.0032	1.2865	1.118
490	43.342	175	4.70	20344	0.001759	0.0435	4.28	0.0033	1.2807	1.086
500	42.477	136	4.75	11966	0.002939	0.0428	4.20	0.0025	1.2747	1.409
510	41.432	167	4.84	17618	0.001971	0.0420	4.10	0.0031	1.2673	1.157
520	40.647	179	4.77	19280	0.001734	0.0414	4.03	0.0033	1.2619	1.086
530	39.980	184	4.67	19726	0.001626	0.0410	3.98	0.0034	1.2572	1.048
540	39.318	186	4.57	19369	0.001586	0.0406	3.93	0.0035	1.2527	1.029
550	38.688	170	4.50	16066	0.001843	0.0403	3.89	0.0033	1.2483	1.092
560	37.987	174	4.46	16243	0.001766	0.0399	3.84	0.0034	1.2435	1.066
570	37.352	183	4.39	17192	0.001607	0.0395	3.80	0.0036	1.2391	1.016
580	36.728	171	4.34	14784	0.001806	0.0392	3.76	0.0035	1.2348	1.064
590	36.104	174	4.32	14940	0.001737	0.0389	3.72	0.0036	1.2305	1.042
600	35.469	170	4.30	13841	0.001826	0.0386	3.68	0.0035	1.2262	1.064

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

9500.000 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	C _v BTU / LB -R	C _p BTU / LB -R	VELOCITY OF SOUND FT/SEC
* 110.738	0.01193	2644	321	-81.52	-60.54	0.5148	0.271	0.384	4170
120	0.01209	2496	300	-78.25	-56.99	0.5456	0.265	0.382	4084
130	0.01227	2346	280	-74.75	-53.17	0.5761	0.260	0.380	3990
140	0.01245	2205	260	-71.28	-49.38	0.6042	0.255	0.378	3895
150	0.01263	2074	242	-67.83	-45.61	0.6302	0.250	0.376	3799
160	0.01282	1951	226	-64.42	-41.86	0.6544	0.246	0.374	3704
170	0.01301	1836	211	-61.03	-38.14	0.6770	0.242	0.371	3611
180	0.01321	1729	197	-57.67	-34.44	0.6982	0.238	0.369	3521
190	0.01341	1629	184	-54.35	-30.76	0.7180	0.234	0.366	3434
200	0.01362	1535	173	-51.07	-27.11	0.7368	0.230	0.363	3352
210	0.01383	1448	162	-47.82	-23.49	0.7544	0.225	0.360	3276
220	0.01405	1366	153	-44.62	-19.91	0.7711	0.219	0.356	3207
230	0.01427	1290	144	-41.47	-16.37	0.7868	0.212	0.351	3147
240	0.01450	1218	136	-38.33	-12.82	0.8019	0.214	0.356	3067
250	0.01474	1151	129	-35.19	-9.26	0.8165	0.212	0.358	3003
260	0.01499	1088	123	-32.03	-5.66	0.8306	0.210	0.361	2943
270	0.01526	1036	116	-28.82	-1.97	0.8445	0.209	0.358	2888
280	0.01552	1001	110	-25.72	1.58	0.8574	0.206	0.356	2830
290	0.01578	983	103	-22.64	5.12	0.8698	0.208	0.353	2780
300	0.01605	926	97	-19.58	8.65	0.8818	0.206	0.352	2709
310	0.01632	882	92	-16.54	12.17	0.8933	0.204	0.350	2646
320	0.01661	856	86	-13.54	15.67	0.9044	0.203	0.346	2596
330	0.01689	811	81	-10.56	19.15	0.9152	0.202	0.345	2530
340	0.01719	776	77	-7.62	22.62	0.9255	0.201	0.342	2475
350	0.01752	656	74	-4.61	26.21	0.9359	0.199	0.364	2360
360	0.01784	733	70	-1.69	29.69	0.9457	0.197	0.339	2416
370	0.01818	645	67	1.25	33.24	0.9554	0.195	0.353	2324
380	0.01852	658	64	4.14	36.73	0.9647	0.193	0.342	2324
390	0.01887	645	61	6.98	40.17	0.9737	0.191	0.338	2296
400	0.01919	664	57	9.73	43.49	0.9821	0.190	0.324	2292
410	0.01955	582	54	12.47	46.87	0.9904	0.188	0.336	2195
420	0.01991	590	52	15.18	50.19	0.9984	0.186	0.327	2189
430	0.02027	560	49	17.83	53.49	1.0062	0.185	0.327	2143
440	0.02064	539	47	20.45	56.76	1.0137	0.183	0.326	2107
450	0.02101	541	45	23.04	60.00	1.0210	0.182	0.319	2096
460	0.02137	510	43	25.55	63.15	1.0279	0.180	0.320	2048
470	0.02174	529	41	28.03	66.27	1.0346	0.179	0.310	2059
480	0.02212	520	39	30.48	69.39	1.0412	0.178	0.306	2036
490	0.02251	476	38	32.91	72.50	1.0476	0.177	0.313	1977
500	0.02295	487	36	35.38	75.74	1.0541	0.175	0.305	1980
510	0.02328	504	35	37.65	78.60	1.0598	0.174	0.296	1992
520	0.02392	438	35	40.39	82.47	1.0673	0.173	0.328	1962
530	0.02439	451	34	42.87	85.78	1.0736	0.172	0.322	1976
540	0.02480	512	33	45.21	88.84	1.0793	0.172	0.300	2036
550	0.02521	512	31	47.54	91.90	1.0850	0.171	0.295	2023
560	0.02557	531	30	49.74	94.71	1.0900	0.170	0.286	2035
570	0.02599	440	29	52.00	97.71	1.0953	0.169	0.307	1924
580	0.02647	476	28	54.31	100.87	1.1008	0.168	0.294	1964
590	0.02684	491	27	56.46	103.68	1.1056	0.167	0.287	1976
600	0.02728	425	26	58.65	106.64	1.1106	0.166	0.303	1893

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

9500.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	-V(DP/DV)	-(DV/DT)/V	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R ⁻¹	BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	SQ FT/HR		
* 110.738	83.839	266	14.13	221657	0.001447	0.1163	56.07	0.0036	1.5870	6.670
120	82.720	263	13.69	206458	0.001454	0.1145	48.40	0.0036	1.5780	5.816
130	81.523	260	13.21	191233	0.001462	0.1124	41.47	0.0036	1.5683	5.049
140	80.337	257	12.72	177162	0.001469	0.1102	35.72	0.0036	1.5588	4.413
150	79.162	254	12.24	164164	0.001477	0.1077	30.92	0.0036	1.5494	3.884
160	77.998	252	11.78	152165	0.001486	0.1052	26.92	0.0036	1.5402	3.441
170	76.844	248	11.33	141091	0.001495	0.1026	23.57	0.0036	1.5310	3.070
180	75.700	245	10.92	130871	0.001505	0.1000	20.76	0.0036	1.5220	2.757
190	74.565	241	10.55	121440	0.001518	0.0973	18.39	0.0036	1.5130	2.493
200	73.437	237	10.23	112733	0.001532	0.0946	16.40	0.0035	1.5042	2.267
210	72.314	232	9.97	104690	0.001549	0.0919	14.72	0.0035	1.4954	2.074
220	71.196	227	9.79	97254	0.001569	0.0893	13.28	0.0035	1.4867	1.907
230	70.080	220	9.70	90373	0.001593	0.0866	12.07	0.0035	1.4781	1.761
240	68.962	220	9.25	83998	0.001622	0.0840	11.02	0.0034	1.4694	1.682
250	67.842	216	9.01	78084	0.001656	0.0815	10.13	0.0034	1.4608	1.602
260	66.714	213	8.79	72591	0.001697	0.0789	9.36	0.0033	1.4522	1.542
270	65.527	213	8.51	69221	0.001681	0.0763	8.67	0.0033	1.4431	1.464
280	64.445	210	8.24	64517	0.001700	0.0740	8.13	0.0032	1.4349	1.411
290	63.369	213	7.83	62322	0.001657	0.0717	7.67	0.0032	1.4268	1.360
300	62.315	209	7.59	57691	0.001686	0.0696	7.27	0.0032	1.4188	1.323
310	61.261	206	7.32	54014	0.001697	0.0675	6.93	0.0031	1.4109	1.293
320	60.222	206	7.05	51520	0.001676	0.0656	6.63	0.0031	1.4031	1.258
330	59.196	203	6.80	47985	0.001696	0.0637	6.37	0.0031	1.3955	1.240
340	58.176	201	6.58	45130	0.001701	0.0620	6.14	0.0031	1.3879	1.221
350	57.077	185	6.51	37426	0.001974	0.0601	5.97	0.0029	1.3797	1.303
360	56.058	199	6.34	41067	0.001705	0.0585	5.81	0.0031	1.3722	1.213
370	55.003	187	6.24	35459	0.001889	0.0569	5.66	0.0029	1.3645	1.263
380	53.989	191	6.11	35499	0.001796	0.0554	5.51	0.0030	1.3570	1.228
390	53.008	191	5.97	34186	0.001772	0.0540	5.38	0.0030	1.3499	1.211
400	52.097	196	5.79	34570	0.001654	0.0528	5.26	0.0031	1.3433	1.162
410	51.151	184	5.67	29773	0.001829	0.0516	5.14	0.0030	1.3364	1.204
420	50.234	187	5.54	29636	0.001749	0.0505	5.03	0.0031	1.3298	1.170
430	49.338	183	5.42	27606	0.001788	0.0495	4.92	0.0031	1.3233	1.171
440	48.458	181	5.31	26097	0.001804	0.0485	4.82	0.0031	1.3170	1.166
450	47.594	183	5.19	25735	0.001744	0.0476	4.73	0.0031	1.3108	1.139
460	46.785	178	5.07	23841	0.001796	0.0468	4.64	0.0031	1.3051	1.142
470	45.998	184	4.97	24344	0.001684	0.0461	4.56	0.0032	1.2995	1.102
480	45.211	184	4.87	23495	0.001668	0.0454	4.48	0.0033	1.2939	1.088
490	44.429	176	4.79	21157	0.001777	0.0447	4.41	0.0032	1.2884	1.110
500	43.581	180	4.71	21216	0.001695	0.0440	4.33	0.0033	1.2824	1.078
510	42.951	185	4.63	21654	0.001600	0.0436	4.27	0.0034	1.2780	1.046
520	41.803	171	4.85	18325	0.001916	0.0426	4.16	0.0031	1.2699	1.154
530	40.997	175	4.81	18498	0.001838	0.0420	4.09	0.0032	1.2643	1.129
540	40.328	190	4.72	20666	0.001581	0.0416	4.04	0.0034	1.2597	1.048
550	39.660	191	4.62	20303	0.001542	0.0412	3.99	0.0035	1.2550	1.028
560	39.115	197	4.54	20779	0.001452	0.0409	3.95	0.0037	1.2512	0.996
570	38.480	178	4.49	16927	0.001725	0.0405	3.91	0.0034	1.2469	1.066
580	37.781	187	4.44	17974	0.001570	0.0401	3.86	0.0036	1.2420	1.018
590	37.252	192	4.39	18298	0.001494	0.0399	3.83	0.0037	1.2384	0.991
600	36.653	178	4.35	15580	0.001700	0.0396	3.79	0.0036	1.2343	1.043

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

10000.000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM	ISOCHORE	INTERNAL	ENTHALPY	ENTROPY	C _v	C _p	VELOCITY
DEG. R	CU FT/LB	DERIVATIVE	DERIVATIVE	ENERGY	BTU/LB	BTU/LB-R	BTU / LB -R		OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB					FT/SEC
* 111.385	0.01191	2671	321	-81.42	-59.36	0.5154	0.271	0.384	4186
120	0.01206	2534	302	-78.40	-56.06	0.5440	0.266	0.382	4107
130	0.01223	2385	281	-74.91	-52.25	0.5745	0.260	0.380	4014
140	0.01241	2244	262	-71.45	-48.47	0.6025	0.256	0.378	3919
150	0.01259	2113	244	-68.02	-44.70	0.6285	0.251	0.375	3825
160	0.01278	1991	228	-64.62	-40.96	0.6527	0.247	0.373	3731
170	0.01297	1876	213	-61.25	-37.24	0.6752	0.243	0.371	3639
180	0.01316	1769	199	-57.91	-33.54	0.6963	0.239	0.368	3550
190	0.01336	1669	186	-54.61	-29.87	0.7162	0.235	0.365	3465
200	0.01356	1576	174	-51.34	-26.23	0.7348	0.231	0.362	3384
210	0.01376	1489	164	-48.11	-22.63	0.7525	0.226	0.359	3309
220	0.01397	1407	154	-44.93	-19.06	0.7691	0.220	0.355	3241
230	0.01419	1331	146	-41.81	-15.53	0.7847	0.213	0.350	3182
240	0.01442	1259	138	-38.70	-12.00	0.7998	0.215	0.354	3103
250	0.01465	1192	131	-35.58	-8.45	0.8142	0.212	0.356	3040
260	0.01489	1129	125	-32.45	-4.88	0.8282	0.211	0.358	2982
270	0.01514	1069	120	-29.31	-1.28	0.8418	0.209	0.363	2929
280	0.01540	1104	112	-26.19	2.32	0.8549	0.207	0.347	2924
290	0.01566	983	105	-23.09	5.92	0.8676	0.209	0.358	2793
300	0.01592	926	99	-20.06	9.42	0.8794	0.206	0.357	2722
310	0.01618	882	94	-17.05	12.91	0.8909	0.205	0.355	2659
320	0.01645	856	89	-14.05	16.42	0.9020	0.204	0.352	2611
330	0.01673	811	84	-11.10	19.87	0.9126	0.203	0.351	2545
340	0.01702	776	79	-8.15	23.36	0.9230	0.202	0.348	2489
350	0.01728	656	75	-5.34	26.66	0.9326	0.200	0.366	2357
360	0.01764	733	72	-2.28	30.38	0.9431	0.198	0.346	2434
370	0.01793	645	69	0.54	33.75	0.9523	0.196	0.357	2332
380	0.01827	658	66	3.45	37.29	0.9617	0.194	0.349	2339
390	0.01860	645	63	6.27	40.70	0.9706	0.192	0.344	2314
400	0.01894	664	59	9.09	44.16	0.9794	0.190	0.332	2315
410	0.01923	696	56	11.71	47.32	0.9871	0.189	0.317	2328
420	0.01958	604	54	14.41	50.66	0.9952	0.187	0.331	2223
430	0.01992	615	51	17.06	53.94	1.0029	0.186	0.321	2220
440	0.02026	582	49	19.66	57.19	1.0104	0.184	0.322	2172
450	0.02061	560	47	22.24	60.41	1.0176	0.183	0.322	2137
460	0.02097	563	45	24.78	63.62	1.0247	0.181	0.315	2128
470	0.02131	529	43	27.24	66.71	1.0313	0.180	0.317	2077
480	0.02166	549	41	29.68	69.79	1.0378	0.179	0.307	2088
490	0.02202	539	39	32.10	72.88	1.0442	0.178	0.304	2066
500	0.02238	492	38	34.47	75.91	1.0503	0.177	0.311	2003
510	0.02284	504	36	36.96	79.25	1.0569	0.175	0.303	2008
520	0.02313	521	35	39.16	82.00	1.0622	0.174	0.295	2022
530	0.02366	257	35	41.71	85.53	1.0690	0.173	0.433	1728
540	0.02418	464	34	44.26	89.04	1.0755	0.172	0.321	2002
550	0.02460	532	33	46.63	92.19	1.0813	0.171	0.299	2074
560	0.02497	551	32	48.89	95.12	1.0866	0.170	0.291	2085
570	0.02535	551	31	51.13	98.07	1.0918	0.170	0.286	2074
580	0.02567	452	30	53.26	100.79	1.0965	0.169	0.307	1951
590	0.02611	464	29	55.53	103.87	1.1018	0.168	0.301	1965
600	0.02655	507	28	57.76	106.92	1.1069	0.167	0.287	2010

* TWO PHASE BOUNDARY

TABLE 1. THERMOPHYSICAL PROPERTIES OF OXYGEN

10000.000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(OP/DOU)	-V(OP/DV)	-(DV/DT)/V	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R ¹	BTU/FT-HR-R	LB/FT-SEC X 10 ⁵	SQ FT/HR		
* 111.385	83.949	268	14.10	224242	0.001431	0.1165	56.90	0.0036	1.5879	6.749
120	82.919	266	13.69	210135	0.001436	0.1149	49.67	0.0036	1.5796	5.944
130	81.734	263	13.20	194901	0.001442	0.1129	42.61	0.0036	1.5700	5.162
140	80.561	261	12.72	180818	0.001448	0.1107	36.74	0.0036	1.5606	4.513
150	79.401	258	12.24	167805	0.001454	0.1083	31.84	0.0036	1.5513	3.972
160	78.252	255	11.77	155787	0.001461	0.1058	27.74	0.0036	1.5422	3.520
170	77.114	252	11.33	144690	0.001469	0.1033	24.31	0.0036	1.5331	3.140
180	75.986	249	10.92	134444	0.001477	0.1007	21.42	0.0036	1.5242	2.819
190	74.868	246	10.55	124982	0.001488	0.0981	19.00	0.0036	1.5154	2.547
200	73.758	242	10.23	116241	0.001500	0.0955	16.94	0.0036	1.5067	2.315
210	72.655	237	9.97	108159	0.001514	0.0929	15.21	0.0036	1.4981	2.116
220	71.557	231	9.79	100681	0.001532	0.0902	13.73	0.0036	1.4895	1.943
230	70.461	225	9.71	93752	0.001554	0.0877	12.47	0.0036	1.4810	1.791
240	69.366	224	9.27	87325	0.001580	0.0851	11.39	0.0035	1.4726	1.708
250	68.268	221	9.04	81355	0.001611	0.0825	10.47	0.0034	1.4641	1.623
260	67.165	217	8.83	75800	0.001649	0.0800	9.67	0.0033	1.4556	1.558
270	66.053	214	8.64	70626	0.001693	0.0776	8.98	0.0032	1.4471	1.511
280	64.950	212	8.31	71684	0.001561	0.0752	8.39	0.0033	1.4387	1.394
290	63.845	213	7.90	62789	0.001680	0.0728	7.88	0.0032	1.4304	1.395
300	62.825	209	7.66	58163	0.001709	0.0708	7.47	0.0032	1.4227	1.356
310	61.803	206	7.39	54492	0.001722	0.0687	7.11	0.0031	1.4150	1.324
320	60.776	206	7.13	51994	0.001704	0.0668	6.80	0.0031	1.4073	1.288
330	59.784	203	6.88	48462	0.001724	0.0650	6.53	0.0031	1.3998	1.269
340	58.765	201	6.65	45587	0.001729	0.0631	6.29	0.0031	1.3923	1.246
350	57.866	185	6.47	37944	0.001975	0.0616	6.11	0.0029	1.3856	1.306
360	56.698	199	6.44	41536	0.001739	0.0597	5.93	0.0030	1.3769	1.235
370	55.770	187	6.27	35953	0.001908	0.0582	5.79	0.0029	1.3701	1.277
380	54.730	191	6.19	35986	0.001827	0.0566	5.64	0.0030	1.3625	1.249
390	53.775	191	6.06	34681	0.001808	0.0553	5.50	0.0030	1.3555	1.235
400	52.795	196	5.91	35034	0.001698	0.0539	5.37	0.0031	1.3483	1.191
410	51.999	204	5.74	36210	0.001558	0.0529	5.27	0.0032	1.3426	1.137
420	51.081	189	5.64	30862	0.001747	0.0518	5.15	0.0031	1.3359	1.185
430	50.208	193	5.51	30881	0.001664	0.0507	5.05	0.0031	1.3296	1.150
440	49.352	189	5.39	28716	0.001707	0.0498	4.95	0.0031	1.3234	1.154
450	48.512	186	5.29	27152	0.001726	0.0489	4.85	0.0031	1.3174	1.150
460	47.680	189	5.18	26850	0.001668	0.0480	4.76	0.0032	1.3115	1.124
470	46.917	184	5.06	24830	0.001723	0.0473	4.68	0.0032	1.3060	1.130
480	46.164	189	4.97	25329	0.001620	0.0466	4.60	0.0033	1.3007	1.092
490	45.406	189	4.87	24477	0.001606	0.0459	4.53	0.0033	1.2953	1.079
500	44.682	181	4.78	21980	0.001718	0.0453	4.46	0.0033	1.2902	1.102
510	43.784	185	4.70	22074	0.001635	0.0445	4.37	0.0034	1.2838	1.070
520	43.229	190	4.64	22541	0.001549	0.0441	4.33	0.0035	1.2799	1.041
530	42.257	135	4.78	10880	0.003209	0.0433	4.23	0.0024	1.2731	1.524
540	41.351	179	4.83	19185	0.001791	0.0426	4.15	0.0032	1.2668	1.126
550	40.648	195	4.77	21606	0.001536	0.0421	4.10	0.0035	1.2619	1.047
560	40.055	200	4.68	22055	0.001450	0.0418	4.05	0.0036	1.2578	1.014
570	39.453	202	4.59	21720	0.001415	0.0414	4.01	0.0037	1.2536	0.996
580	38.962	182	4.51	17618	0.001685	0.0412	3.98	0.0034	1.2502	1.066
590	38.300	186	4.48	17790	0.001620	0.0408	3.93	0.0035	1.2456	1.043
600	37.666	196	4.44	19084	0.001462	0.0405	3.89	0.0037	1.2412	0.993

* TWO PHASE BOUNDARY