

DuPont™ Suva®
refrigerants

**Thermodynamic
Properties
of**

**DuPont™
Suva® MP66**
Refrigerant

(R-401B)

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The miracles of science™

Thermodynamic Properties of Suva[®] MP66 Refrigerant

Engineering (I/P) Units

New tables of the thermodynamic properties of Suva[®] MP66 refrigerant [ASHRAE designation: R-401B (61/11/28)], a near azeotropic blend of HCFC-22/HFC-152a/HCFC-124, have been developed and are presented here. These tables are based on extensive experimental measurements. Equations have been developed, based on the Peng-Robinson-Stryjek-Vera (PRSV) equation of state, which represent the data with accuracy and consistency throughout the entire range of temperature, pressure, and density presented in these tables.

Physical Properties

Chemical Formula	CHClF ₂ /CH ₃ CHF ₂ /CHClFCF ₃ (61/11/28% by weight)	
Molecular Weight	92.84	
Boiling Point at One Atmosphere	-30.41°F	(-34.67°C)
Critical Temperature, T _c	222.98°F 682.65°R	(106.10°C) (379.25 K)
Critical Pressure, P _c	679.0 psia	(4681.5 kPa [abs])
Critical Density, D _c	32.01 lb/ft ³	(512.7 kg/m ³)
Critical Volume, V _c	0.0312 ft ³ /lb	(0.00195 m ³ /kg)

Units and Factors

t	= temperature in °F
T	= temperature in °R = °F + 459.67
p _f	= pressure of saturated liquid (bubble point) in psia
p _g	= pressure of saturated vapor (dew point) in psia
v _f	= volume of saturated liquid in ft ³ /lb
v _g	= volume of saturated vapor in ft ³ /lb
V	= volume of superheated vapor in ft ³ /lb
d _f	= 1/v _f = density of saturated liquid in lb/ft ³
d _g	= 1/v _g = density of saturated vapor in lb/ft ³
h _f	= enthalpy of saturated liquid in Btu/lb
h _{fg}	= enthalpy of vaporization in Btu/lb
h _g	= enthalpy of saturated vapor in Btu/lb
H	= enthalpy of superheated vapor in Btu/lb
s _f	= entropy of saturated liquid in Btu/(lb) (°R)
s _g	= entropy of saturated vapor in Btu/(lb) (°R)
S	= entropy of superheated vapor in Btu/(lb) (°R)
C _p	= heat capacity at constant pressure in Btu/(lb) (°F)
C _v	= heat capacity at constant volume in Btu/(lb) (°F)
The gas constant, R	= 10.732 (psia) (ft ³)/(lb-mole) (°R) for Suva [®] MP66, R = 0.1156 (psia) (ft ³)/(lb) (°R)
Conversion factor from Work Units to Heat Units:	
J	= 0.185053
Btu/lb	= [(psia) (ft ³)/lb] ∞ J
One atmosphere	= 14.696 psia

Reference point for enthalpy and entropy:

$$h_f = 0.0 \text{ Btu/lb at } -40^\circ\text{F}$$

$$s_f = 0.0 \text{ Btu/(lb) (}^\circ\text{R) at } -40^\circ\text{F}$$

Equations

The Peng-Robinson-Stryjek-Vera (PRSV) equation of state was used to calculate the tables of thermodynamic properties. It was chosen as the preferred equation of state because it provided an accurate fit of the thermodynamic data over the entire range of temperatures and pressures presented in these tables.

The constants for the PRSV equation of state were calculated in SI units. For conversion of thermodynamic properties to Engineering (I/P) units, conversion factors are provided for each property derived from the PRSV equation of state.

1. Equation of State (PRSV)

$$P = RT/(V-b) - a/(V^2 + 2bV - b^2)$$

where P is in kPa, T is in K, V is in m³/mole, and R = 0.008314 kJ/(mole) (K). The constants a and b are calculated as follows:

$$a = \sum_{i=1}^3 \sum_{j=1}^3 x_i x_j a_{ij} \quad b = \sum_{i=1}^3 x_i b_i$$

where

$$a_{ij} = (a_i a_j)^{0.5} (1 - k_{ij}) \quad b_i = 0.077796 RT_{ci}/P_{ci}$$

x_i = mole fraction of component i

x_j = mole fraction of component j

$$a_i = (0.457235 R^2 T_{ci}^2/P_{ci}) \alpha_i$$

$$a_j = (0.457235 R^2 T_{cj}^2/P_{cj}) \alpha_j$$

k_{ij} = binary interaction parameter for components i and j

$$\alpha_i = [1 + \kappa_i (1 - T_{ri}^{0.5})]^2$$

$$\kappa_i = \kappa_{0i} + \kappa_{1i} [(1 + T_{ri}^{0.5}) (0.7 - T_{ri})]$$

(Note: κ_i = κ_{0i} for T_r > 0.7)

$$\kappa_{0i} = 0.378893 + 1.4897153\omega_i - 0.17131848\omega_i^2 + 0.0196554\omega_i^3$$

κ_{1i} = adjustable parameter for component i

$$T_{ri} = T_i/T_{ci} \text{ for component } i$$

Values for R , T_{c_i} , P_{c_i} , ω_i , κ_{1i} , x_i , and k_{ij} are needed to calculate constants a and b . $R = 0.008314$ kJ/(mole) (K). The remaining constants for Suva[®] MP66 are summarized below:

Component	T_{c_i}	P_{c_i}	ω_i	κ_{1i}	x_i
HCFC-22 (i = 1)	369.16	4977.0	0.2214	0.0360	0.65492
HFC-152a (i = 2)	386.44	4519.8	0.2752	-0.0400	0.15461
HCFC-124 (i = 3)	395.39	3616.0	0.2859	0.0490	0.19047

The binary interaction parameters, k_{ij} , for Suva[®] MP66 are:

$$k_{11} = 0.00000 \quad k_{12} = -0.02652 \quad k_{13} = 0.00052$$

$$k_{21} = -0.02652 \quad k_{22} = 0.00000 \quad k_{23} = -0.01314$$

$$k_{31} = 0.00052 \quad k_{32} = -0.01314 \quad k_{33} = 0.00000$$

Ideal Gas Heat Capacity Equation (at constant pressure):

$$C_p^o(\text{mixture}) = \sum_{i=1}^3 x_i C_{p_i}^o$$

$$C_{p_i}^o = 4.184 (A_i + B_i T + C_i T^2 + D_i T^3 + E_i T^4 + F_i T^5)$$

where C_p^o and $C_{p_i}^o$ are in J/(mole) (K) and T is in K. x_i is the mole fraction of component i in the mixture (use same values listed in PRSV constants for Suva[®] MP66).

A_i , B_i , C_i , D_i , E_i , and F_i are constants:

$A_1 = 6.164370$ E+00	$B_1 = 0.173407$ E-01
$A_2 = 2.072000$ E+00	$B_2 = 0.572200$ E-01
$A_3 = -4.130590$ E+01	$B_3 = 0.587312$ E+00
$C_1 = 0.557618$ E-04	$D_1 = -0.140596$ E-06
$C_2 = -0.348000$ E-04	$D_2 = 0.810700$ E-08
$C_3 = -0.233021$ E-02	$D_3 = 0.517788$ E-05
$E_1 = 0.120557$ E-09	$F_1 = -0.368814$ E-13
$E_2 = 0.000000$ E+00	$F_2 = 0.000000$ E+00
$E_3 = -0.599647$ E-08	$F_3 = 0.287937$ E-11

Properties calculated in SI units from the equations and constants listed above can be converted to I/P units using the conversion factors shown below. Please note that in converting enthalpy and entropy from SI to I/P units, a change in reference states must be included (from $H = 200$ and $S = 1$ at 0°C for SI units to $H = 0$ and $S = 0$ at -40°F for I/P units). In the conversion equations below, $H(\text{ref})$ and $S(\text{ref})$ are the saturated liquid enthalpy and entropy at -40°C . For Suva[®] MP66: $H(\text{ref}) = 153.8$ kJ/kg and $S(\text{ref}) = 0.8184$ kJ/kg \cdot K.

Conversion Factors (SI units to I/P units):

P (psia)	$= P$ (kPa) \cdot 0.14504
T ($^\circ\text{F}$)	$= (T[^\circ\text{C}] \cdot 1.8) + 32$
D (lb/ft ³)	$= D$ (kg/m ³) \cdot 0.062428
V (ft ³ /lb)	$= V$ (m ³ /kg) \cdot 16.018
H (Btu/lb)	$= [H$ (kJ/kg) $- H(\text{ref})] \cdot 0.43021$
S (Btu/lb \cdot $^\circ\text{R}$)	$= [S$ (kJ/kg \cdot K) $- S(\text{ref})] \cdot 0.23901$
C_p (Btu/lb \cdot $^\circ\text{F}$)	$= C_p$ (kJ/kg \cdot K) \cdot 0.23901
C_v (Btu/lb \cdot $^\circ\text{F}$)	$= C_v$ (kJ/kg \cdot K) \cdot 0.23901

2. Vapor Pressure

$$\log_n P = A + B/T + C \log_n T + D T^2$$

For SI units

T is in K and P is in kPa (abs)

A , B , C and D are constants.

Constants for vapor pressure of saturated liquid (bubble point), p_f :

$$A = 5.69933 \text{ E}+01 \quad C = -6.72303 \text{ E}+00$$

$$B = -3.86429 \text{ E}+03 \quad D = 1.10442 \text{ E}-05$$

Constants for vapor pressure of saturated vapor (dew point), p_g :

$$A = 7.52389 \text{ E}+01 \quad C = -9.59126 \text{ E}+00$$

$$B = -4.60476 \text{ E}+03 \quad D = 1.60025 \text{ E}-05$$

For I/P units

T is in $^\circ\text{R}$ and P is in psia

A , B , C and D are constants.

Constants for vapor pressure of saturated liquid (bubble point), p_f :

$$A = 5.90146 \text{ E}+01 \quad C = -6.72303 \text{ E}+00$$

$$B = -6.95582 \text{ E}+03 \quad D = 0.34082 \text{ E}-05$$

Constants for vapor pressure of saturated vapor (dew point), p_g :

$$A = 7.89459 \text{ E}+01 \quad C = -9.59126 \text{ E}+00$$

$$B = -8.28863 \text{ E}+03 \quad D = 0.49387 \text{ E}-05$$

3. Density of the Saturated Liquid

$$d_f/D_c = a_0 + a_1 z + a_2 z^2 + a_3 z^3 + a_4 z^4$$

$$\text{where } z = (1 - T/T_c)^{1/3} - t_0$$

Because both density and temperature appear in the reduced form in the equation, the same constants can be used for either SI or I/P units.

d_f and D_c are in kg/m^3 in SI units and lb/ft^3 in I/P units; T and T_c are in K in SI units and $^\circ\text{R}$ in I/P units; $a_0, a_1, a_2, a_3, a_4,$ and t_0 are constants:

$$a_0 = 2.289321$$

$$a_3 = -1.206543$$

$$a_1 = 2.819138$$

$$a_4 = -4.205078$$

$$a_2 = 1.781901$$

$$t_0 = 0.5850235$$

Table 1
Suva® MP66 Saturation Properties—Temperature Table

TEMP. °F	PRESSURE psia		VOLUME ft ³ /lb		DENSITY lb/ft ³		ENTHALPY Btu/lb			ENTROPY Btu/(lb)(°R)		TEMP. °F
	LIQUID P _f	VAPOR P _g	LIQUID v _f	VAPOR v _g	LIQUID 1/v _f	VAPOR 1/v _g	LIQUID h _f	LATENT h _{fg}	VAPOR h _g	LIQUID s _f	VAPOR s _g	
-150	0.19	0.10	0.0102	370.3704	98.26	0.0027	-26.3	112.3	86.0	-0.0723	0.2990	-150
-149	0.20	0.10	0.0102	357.1429	98.17	0.0028	-26.1	112.2	86.1	-0.0716	0.2981	-149
-148	0.21	0.11	0.0102	333.3333	98.09	0.0030	-25.9	112.1	86.2	-0.0709	0.2972	-148
-147	0.22	0.11	0.0102	322.5806	98.00	0.0031	-25.6	112.0	86.3	-0.0702	0.2964	-147
-146	0.23	0.12	0.0102	303.0303	97.91	0.0033	-25.4	111.9	86.5	-0.0695	0.2955	-146
-145	0.24	0.13	0.0102	285.7143	97.82	0.0035	-25.2	111.8	86.6	-0.0688	0.2947	-145
-144	0.26	0.13	0.0102	270.2703	97.74	0.0037	-25.0	111.7	86.7	-0.0681	0.2938	-144
-143	0.27	0.14	0.0102	256.4103	97.65	0.0039	-24.7	111.5	86.8	-0.0674	0.2930	-143
-142	0.28	0.15	0.0103	243.9024	97.56	0.0041	-24.5	111.4	86.9	-0.0666	0.2922	-142
-141	0.30	0.16	0.0103	232.5581	97.47	0.0043	-24.3	111.3	87.0	-0.0659	0.2914	-141
-140	0.31	0.17	0.0103	222.2222	97.38	0.0045	-24.1	111.2	87.2	-0.0652	0.2906	-140
-139	0.33	0.18	0.0103	208.3333	97.29	0.0048	-23.8	111.1	87.3	-0.0645	0.2898	-139
-138	0.34	0.19	0.0103	200.0000	97.21	0.0050	-23.6	111.0	87.4	-0.0638	0.2890	-138
-137	0.36	0.20	0.0103	188.6792	97.12	0.0053	-23.4	110.9	87.5	-0.0631	0.2883	-137
-136	0.38	0.21	0.0103	181.8182	97.03	0.0055	-23.2	110.8	87.6	-0.0624	0.2875	-136
-135	0.40	0.22	0.0103	172.4138	96.94	0.0058	-22.9	110.7	87.8	-0.0617	0.2868	-135
-134	0.42	0.23	0.0103	163.9344	96.85	0.0061	-22.7	110.6	87.9	-0.0611	0.2860	-134
-133	0.44	0.24	0.0103	156.2500	96.76	0.0064	-22.5	110.5	88.0	-0.0604	0.2853	-133
-132	0.46	0.25	0.0103	149.2537	96.67	0.0067	-22.3	110.4	88.1	-0.0597	0.2845	-132
-131	0.48	0.27	0.0104	142.8571	96.58	0.0070	-22.0	110.3	88.2	-0.0590	0.2838	-131
-130	0.50	0.28	0.0104	135.1351	96.49	0.0074	-21.8	110.2	88.4	-0.0583	0.2831	-130
-129	0.52	0.30	0.0104	129.8701	96.40	0.0077	-21.6	110.1	88.5	-0.0576	0.2824	-129
-128	0.55	0.31	0.0104	123.4568	96.31	0.0081	-21.4	109.9	88.6	-0.0569	0.2817	-128
-127	0.57	0.33	0.0104	117.6471	96.22	0.0085	-21.1	109.8	88.7	-0.0562	0.2810	-127
-126	0.60	0.34	0.0104	112.3596	96.13	0.0089	-20.9	109.7	88.8	-0.0555	0.2803	-126
-125	0.63	0.36	0.0104	107.5269	96.04	0.0093	-20.7	109.6	89.0	-0.0548	0.2796	-125
-124	0.65	0.38	0.0104	102.0408	95.95	0.0098	-20.4	109.5	89.1	-0.0542	0.2790	-124
-123	0.68	0.40	0.0104	98.0392	95.86	0.0102	-20.2	109.4	89.2	-0.0535	0.2783	-123
-122	0.71	0.42	0.0104	93.4579	95.77	0.0107	-20.0	109.3	89.3	-0.0528	0.2776	-122
-121	0.75	0.44	0.0105	89.2857	95.68	0.0112	-19.7	109.2	89.4	-0.0521	0.2770	-121
-120	0.78	0.46	0.0105	85.4701	95.59	0.0117	-19.5	109.1	89.6	-0.0514	0.2763	-120
-119	0.81	0.48	0.0105	81.9672	95.50	0.0122	-19.3	109.0	89.7	-0.0508	0.2757	-119
-118	0.85	0.50	0.0105	78.7402	95.40	0.0127	-19.1	108.9	89.8	-0.0501	0.2751	-118
-117	0.88	0.53	0.0105	75.1880	95.31	0.0133	-18.8	108.8	89.9	-0.0494	0.2744	-117
-116	0.92	0.55	0.0105	71.9424	95.22	0.0139	-18.6	108.6	90.1	-0.0487	0.2738	-116
-115	0.96	0.58	0.0105	68.9655	95.13	0.0145	-18.4	108.5	90.2	-0.0481	0.2732	-115
-114	1.00	0.60	0.0105	66.2252	95.04	0.0151	-18.1	108.4	90.3	-0.0474	0.2726	-114
-113	1.04	0.63	0.0105	63.2911	94.94	0.0158	-17.9	108.3	90.4	-0.0467	0.2720	-113
-112	1.09	0.66	0.0105	60.9756	94.85	0.0164	-17.7	108.2	90.6	-0.0460	0.2714	-112
-111	1.13	0.69	0.0106	58.4795	94.76	0.0171	-17.4	108.1	90.7	-0.0454	0.2708	-111
-110	1.18	0.72	0.0106	55.8659	94.67	0.0179	-17.2	108.0	90.8	-0.0447	0.2702	-110
-109	1.22	0.75	0.0106	53.7634	94.58	0.0186	-17.0	107.9	90.9	-0.0440	0.2697	-109
-108	1.27	0.79	0.0106	51.5464	94.48	0.0194	-16.7	107.8	91.1	-0.0434	0.2691	-108
-107	1.33	0.82	0.0106	49.5050	94.39	0.0202	-16.5	107.7	91.2	-0.0427	0.2685	-107
-106	1.38	0.86	0.0106	47.6190	94.30	0.0210	-16.3	107.6	91.3	-0.0420	0.2680	-106
-105	1.43	0.89	0.0106	45.8716	94.20	0.0218	-16.0	107.5	91.4	-0.0414	0.2674	-105
-104	1.49	0.93	0.0106	44.0529	94.11	0.0227	-15.8	107.3	91.6	-0.0407	0.2669	-104
-103	1.55	0.97	0.0106	42.3729	94.02	0.0236	-15.6	107.2	91.7	-0.0401	0.2663	-103
-102	1.61	1.01	0.0106	40.6504	93.92	0.0246	-15.3	107.1	91.8	-0.0394	0.2658	-102
-101	1.67	1.05	0.0107	39.2157	93.83	0.0255	-15.1	107.0	91.9	-0.0387	0.2653	-101
-100	1.73	1.10	0.0107	37.7358	93.73	0.0265	-14.8	106.9	92.1	-0.0381	0.2648	-100
-99	1.80	1.14	0.0107	36.2319	93.64	0.0276	-14.6	106.8	92.2	-0.0374	0.2642	-99
-98	1.87	1.19	0.0107	34.9650	93.55	0.0286	-14.4	106.7	92.3	-0.0368	0.2637	-98
-97	1.94	1.24	0.0107	33.6700	93.45	0.0297	-14.1	106.6	92.4	-0.0361	0.2632	-97
-96	2.01	1.29	0.0107	32.3625	93.36	0.0309	-13.9	106.5	92.6	-0.0354	0.2627	-96
-95	2.08	1.34	0.0107	31.2500	93.26	0.0320	-13.7	106.3	92.7	-0.0348	0.2622	-95
-94	2.16	1.40	0.0107	30.1205	93.17	0.0332	-13.4	106.2	92.8	-0.0341	0.2617	-94
-93	2.24	1.45	0.0107	28.9855	93.07	0.0345	-13.2	106.1	93.0	-0.0335	0.2613	-93
-92	2.32	1.51	0.0108	28.0112	92.98	0.0357	-12.9	106.0	93.1	-0.0328	0.2608	-92
-91	2.41	1.57	0.0108	26.9542	92.88	0.0371	-12.7	105.9	93.2	-0.0322	0.2603	-91

Table 1 (continued)
Suva® MP66 Saturation Properties—Temperature Table

TEMP. °F	PRESSURE psia		VOLUME ft ³ /lb		DENSITY lb/ft ³		ENTHALPY Btu/lb			ENTROPY Btu/(lb)(°R)		TEMP. °F
	LIQUID P _f	VAPOR P _g	LIQUID v _f	VAPOR v _g	LIQUID 1/v _f	VAPOR 1/v _g	LIQUID h _f	LATENT h _{fg}	VAPOR h _g	LIQUID s _f	VAPOR s _g	
-90	2.49	1.63	0.0108	26.0417	92.79	0.0384	-12.5	105.8	93.3	-0.0315	0.2598	-90
-89	2.58	1.70	0.0108	25.1256	92.69	0.0398	-12.2	105.7	93.5	-0.0309	0.2594	-89
-88	2.67	1.76	0.0108	24.2718	92.59	0.0412	-12.0	105.6	93.6	-0.0302	0.2589	-88
-87	2.77	1.83	0.0108	23.4192	92.50	0.0427	-11.7	105.5	93.7	-0.0296	0.2584	-87
-86	2.86	1.90	0.0108	22.6244	92.40	0.0442	-11.5	105.3	93.9	-0.0289	0.2580	-86
-85	2.96	1.97	0.0108	21.8341	92.31	0.0458	-11.2	105.2	94.0	-0.0283	0.2575	-85
-84	3.07	2.05	0.0108	21.0970	92.21	0.0474	-11.0	105.1	94.1	-0.0276	0.2571	-84
-83	3.17	2.12	0.0109	20.3666	92.11	0.0491	-10.8	105.0	94.2	-0.0270	0.2567	-83
-82	3.28	2.20	0.0109	19.6850	92.02	0.0508	-10.5	104.9	94.4	-0.0264	0.2562	-82
-81	3.39	2.28	0.0109	19.0476	91.92	0.0525	-10.3	104.8	94.5	-0.0257	0.2558	-81
-80	3.51	2.37	0.0109	18.4162	91.82	0.0543	-10.0	104.7	94.6	-0.0251	0.2554	-80
-79	3.62	2.45	0.0109	17.7936	91.73	0.0562	-9.8	104.5	94.8	-0.0244	0.2550	-79
-78	3.75	2.54	0.0109	17.2117	91.63	0.0581	-9.5	104.4	94.9	-0.0238	0.2545	-78
-77	3.87	2.63	0.0109	16.6667	91.53	0.0600	-9.3	104.3	95.0	-0.0232	0.2541	-77
-76	4.00	2.73	0.0109	16.1290	91.43	0.0620	-9.1	104.2	95.1	-0.0225	0.2537	-76
-75	4.13	2.83	0.0109	15.6006	91.34	0.0641	-8.8	104.1	95.3	-0.0219	0.2533	-75
-74	4.26	2.93	0.0110	15.1057	91.24	0.0662	-8.6	104.0	95.4	-0.0212	0.2529	-74
-73	4.40	3.03	0.0110	14.6413	91.14	0.0683	-8.3	103.9	95.5	-0.0206	0.2525	-73
-72	4.54	3.13	0.0110	14.1844	91.04	0.0705	-8.1	103.7	95.7	-0.0200	0.2521	-72
-71	4.69	3.24	0.0110	13.7363	90.94	0.0728	-7.8	103.6	95.8	-0.0193	0.2517	-71
-70	4.84	3.35	0.0110	13.2979	90.85	0.0752	-7.6	103.5	95.9	-0.0187	0.2514	-70
-69	4.99	3.47	0.0110	12.8866	90.75	0.0776	-7.3	103.4	96.1	-0.0181	0.2510	-69
-68	5.15	3.59	0.0110	12.5000	90.65	0.0800	-7.1	103.3	96.2	-0.0174	0.2506	-68
-67	5.31	3.71	0.0110	12.1212	90.55	0.0825	-6.8	103.2	96.3	-0.0168	0.2502	-67
-66	5.47	3.83	0.0111	11.7509	90.45	0.0851	-6.6	103.0	96.5	-0.0162	0.2499	-66
-65	5.64	3.96	0.0111	11.3895	90.35	0.0878	-6.3	102.9	96.6	-0.0155	0.2495	-65
-64	5.81	4.09	0.0111	11.0497	90.25	0.0905	-6.1	102.8	96.7	-0.0149	0.2492	-64
-63	5.99	4.23	0.0111	10.7181	90.15	0.0933	-5.8	102.7	96.9	-0.0143	0.2488	-63
-62	6.17	4.37	0.0111	10.4058	90.05	0.0961	-5.6	102.6	97.0	-0.0137	0.2484	-62
-61	6.36	4.51	0.0111	10.1010	89.95	0.0990	-5.3	102.5	97.1	-0.0130	0.2481	-61
-60	6.55	4.66	0.0111	9.8039	89.85	0.1020	-5.1	102.3	97.3	-0.0124	0.2478	-60
-59	6.75	4.81	0.0111	9.5147	89.75	0.1051	-4.8	102.2	97.4	-0.0118	0.2474	-59
-58	6.95	4.96	0.0112	9.2421	89.65	0.1082	-4.6	102.1	97.5	-0.0111	0.2471	-58
-57	7.15	5.12	0.0112	8.9767	89.55	0.1114	-4.3	102.0	97.6	-0.0105	0.2467	-57
-56	7.36	5.28	0.0112	8.7184	89.45	0.1147	-4.1	101.9	97.8	-0.0099	0.2464	-56
-55	7.57	5.45	0.0112	8.4746	89.35	0.1180	-3.8	101.7	97.9	-0.0093	0.2461	-55
-54	7.79	5.62	0.0112	8.2305	89.25	0.1215	-3.6	101.6	98.0	-0.0087	0.2458	-54
-53	8.02	5.79	0.0112	8.0000	89.15	0.1250	-3.3	101.5	98.2	-0.0080	0.2454	-53
-52	8.25	5.97	0.0112	7.7760	89.05	0.1286	-3.1	101.4	98.3	-0.0074	0.2451	-52
-51	8.48	6.15	0.0112	7.5586	88.94	0.1323	-2.8	101.3	98.4	-0.0068	0.2448	-51
-50	8.72	6.34	0.0113	7.3529	88.84	0.1360	-2.6	101.1	98.6	-0.0062	0.2445	-50
-49	8.97	6.54	0.0113	7.1480	88.74	0.1399	-2.3	101.0	98.7	-0.0056	0.2442	-49
-48	9.22	6.73	0.0113	6.9541	88.64	0.1438	-2.1	100.9	98.8	-0.0049	0.2439	-48
-47	9.48	6.94	0.0113	6.7659	88.54	0.1478	-1.8	100.8	99.0	-0.0043	0.2436	-47
-46	9.74	7.14	0.0113	6.5833	88.43	0.1519	-1.5	100.6	99.1	-0.0037	0.2433	-46
-45	10.01	7.35	0.0113	6.4061	88.33	0.1561	-1.3	100.5	99.2	-0.0031	0.2430	-45
-44	10.28	7.57	0.0113	6.2344	88.23	0.1604	-1.0	100.4	99.4	-0.0025	0.2427	-44
-43	10.56	7.79	0.0113	6.0680	88.13	0.1648	-0.8	100.3	99.5	-0.0018	0.2424	-43
-42	10.85	8.02	0.0114	5.9102	88.02	0.1692	-0.5	100.2	99.6	-0.0012	0.2421	-42
-41	11.14	8.25	0.0114	5.7537	87.92	0.1738	-0.3	100.0	99.8	-0.0006	0.2418	-41
-40	11.44	8.49	0.0114	5.6022	87.82	0.1785	0.0	99.9	99.9	0.0000	0.2416	-40
-39	11.74	8.73	0.0114	5.4585	87.71	0.1832	0.3	99.8	100.0	0.0006	0.2413	-39
-38	12.05	8.98	0.0114	5.3163	87.61	0.1881	0.5	99.7	100.2	0.0012	0.2410	-38
-37	12.37	9.24	0.0114	5.1787	87.51	0.1931	0.8	99.5	100.3	0.0018	0.2407	-37
-36	12.69	9.50	0.0114	5.0480	87.40	0.1981	1.0	99.4	100.4	0.0025	0.2405	-36
-35	13.02	9.77	0.0115	4.9188	87.30	0.2033	1.3	99.3	100.6	0.0031	0.2402	-35
-34	13.36	10.04	0.0115	4.7939	87.19	0.2086	1.6	99.1	100.7	0.0037	0.2399	-34
-33	13.71	10.32	0.0115	4.6729	87.09	0.2140	1.8	99.0	100.8	0.0043	0.2397	-33
-32	14.06	10.60	0.0115	4.5558	86.99	0.2195	2.1	98.9	101.0	0.0049	0.2394	-32
-31	14.41	10.89	0.0115	4.4425	86.88	0.2251	2.3	98.8	101.1	0.0055	0.2392	-31

Table 1 (continued)
Suva® MP66 Saturation Properties—Temperature Table

TEMP. °F	PRESSURE psia		VOLUME ft ³ /lb		DENSITY lb/ft ³		ENTHALPY Btu/lb			ENTROPY Btu/(lb)(°R)		TEMP. °F
	LIQUID P _f	VAPOR P _g	LIQUID v _f	VAPOR v _g	LIQUID 1/v _f	VAPOR 1/v _g	LIQUID h _f	LATENT h _{fg}	VAPOR h _g	LIQUID s _f	VAPOR s _g	
-30	14.78	11.19	0.0115	4.3328	86.78	0.2308	2.6	98.6	101.2	0.0061	0.2389	-30
-29	15.15	11.49	0.0115	4.2265	86.67	0.2366	2.9	98.5	101.4	0.0067	0.2387	-29
-28	15.53	11.80	0.0116	4.1220	86.56	0.2426	3.1	98.4	101.5	0.0073	0.2384	-28
-27	15.92	12.12	0.0116	4.0225	86.46	0.2486	3.4	98.2	101.6	0.0079	0.2382	-27
-26	16.32	12.44	0.0116	3.9246	86.35	0.2548	3.7	98.1	101.8	0.0085	0.2379	-26
-25	16.72	12.77	0.0116	3.8300	86.25	0.2611	3.9	98.0	101.9	0.0091	0.2377	-25
-24	17.13	13.11	0.0116	3.7383	86.14	0.2675	4.2	97.8	102.0	0.0098	0.2375	-24
-23	17.55	13.45	0.0116	3.6483	86.04	0.2741	4.4	97.7	102.2	0.0104	0.2372	-23
-22	17.98	13.80	0.0116	3.5625	85.93	0.2807	4.7	97.6	102.3	0.0110	0.2370	-22
-21	18.41	14.16	0.0117	3.4783	85.82	0.2875	5.0	97.4	102.4	0.0116	0.2368	-21
-20	18.85	14.53	0.0117	3.3956	85.72	0.2945	5.2	97.3	102.6	0.0122	0.2365	-20
-19	19.30	14.90	0.0117	3.3167	85.61	0.3015	5.5	97.2	102.7	0.0128	0.2363	-19
-18	19.76	15.28	0.0117	3.2394	85.50	0.3087	5.8	97.0	102.8	0.0134	0.2361	-18
-17	20.23	15.67	0.0117	3.1646	85.40	0.3160	6.0	96.9	103.0	0.0140	0.2359	-17
-16	20.71	16.06	0.0117	3.0912	85.29	0.3235	6.3	96.8	103.1	0.0146	0.2356	-16
-15	21.19	16.47	0.0117	3.0202	85.18	0.3311	6.6	96.6	103.2	0.0152	0.2354	-15
-14	21.69	16.88	0.0118	2.9516	85.07	0.3388	6.8	96.5	103.4	0.0158	0.2352	-14
-13	22.19	17.30	0.0118	2.8843	84.97	0.3467	7.1	96.4	103.5	0.0164	0.2350	-13
-12	22.70	17.73	0.0118	2.8193	84.86	0.3547	7.4	96.2	103.6	0.0170	0.2348	-12
-11	23.23	18.16	0.0118	2.7556	84.75	0.3629	7.7	96.1	103.7	0.0176	0.2346	-11
-10	23.76	18.61	0.0118	2.6940	84.64	0.3712	7.9	96.0	103.9	0.0182	0.2344	-10
-9	24.30	19.06	0.0118	2.6337	84.53	0.3797	8.2	95.8	104.0	0.0188	0.2342	-9
-8	24.85	19.52	0.0118	2.5753	84.42	0.3883	8.5	95.7	104.1	0.0194	0.2340	-8
-7	25.41	19.99	0.0119	2.5189	84.31	0.3970	8.7	95.5	104.3	0.0200	0.2338	-7
-6	25.98	20.47	0.0119	2.4631	84.21	0.4060	9.0	95.4	104.4	0.0206	0.2336	-6
-5	26.56	20.96	0.0119	2.4096	84.10	0.4150	9.3	95.3	104.5	0.0212	0.2334	-5
-4	27.14	21.46	0.0119	2.3568	83.99	0.4243	9.6	95.1	104.7	0.0218	0.2332	-4
-3	27.74	21.96	0.0119	2.3057	83.88	0.4337	9.8	95.0	104.8	0.0224	0.2330	-3
-2	28.35	22.48	0.0119	2.2563	83.77	0.4432	10.1	94.8	104.9	0.0230	0.2328	-2
-1	28.97	23.01	0.0120	2.2080	83.66	0.4529	10.4	94.7	105.1	0.0236	0.2326	-1
0	29.60	23.54	0.0120	2.1608	83.55	0.4628	10.7	94.5	105.2	0.0241	0.2324	0
1	30.24	24.09	0.0120	2.1146	83.44	0.4729	10.9	94.4	105.3	0.0247	0.2322	1
2	30.89	24.64	0.0120	2.0700	83.33	0.4831	11.2	94.2	105.4	0.0253	0.2320	2
3	31.56	25.20	0.0120	2.0263	83.22	0.4935	11.5	94.1	105.6	0.0259	0.2319	3
4	32.23	25.78	0.0120	1.9837	83.10	0.5041	11.8	94.0	105.7	0.0265	0.2317	4
5	32.91	26.36	0.0120	1.9425	82.99	0.5148	12.0	93.8	105.8	0.0271	0.2315	5
6	33.61	26.96	0.0121	1.9022	82.88	0.5257	12.8	93.2	106.0	0.0287	0.2313	6
7	34.31	27.56	0.0121	1.8629	82.77	0.5368	13.0	93.1	106.1	0.0293	0.2312	7
8	35.02	28.17	0.0121	1.8245	82.66	0.5481	13.3	92.9	106.2	0.0298	0.2310	8
9	35.74	28.80	0.0121	1.7873	82.55	0.5595	13.6	92.8	106.4	0.0304	0.2308	9
10	36.48	29.43	0.0121	1.7510	82.44	0.5711	13.8	92.6	106.5	0.0310	0.2307	10
11	37.23	30.08	0.0121	1.7156	82.32	0.5829	14.1	92.5	106.6	0.0316	0.2305	11
12	37.99	30.74	0.0122	1.6807	82.21	0.5950	14.4	92.4	106.7	0.0321	0.2303	12
13	38.76	31.41	0.0122	1.6469	82.10	0.6072	14.7	92.2	106.9	0.0327	0.2302	13
14	39.54	32.09	0.0122	1.6139	81.99	0.6196	14.9	92.1	107.0	0.0333	0.2300	14
15	40.34	32.78	0.0122	1.5818	81.87	0.6322	15.2	91.9	107.1	0.0339	0.2298	15
16	41.15	33.48	0.0122	1.5504	81.76	0.6450	15.5	91.8	107.3	0.0345	0.2297	16
17	41.97	34.19	0.0122	1.5198	81.65	0.6580	15.8	91.6	107.4	0.0350	0.2295	17
18	42.80	34.92	0.0123	1.4899	81.53	0.6712	16.0	91.5	107.5	0.0356	0.2294	18
19	43.64	35.65	0.0123	1.4607	81.42	0.6846	16.3	91.3	107.6	0.0362	0.2292	19
20	44.50	36.40	0.0123	1.4323	81.30	0.6982	16.6	91.2	107.8	0.0368	0.2291	20
21	45.37	37.17	0.0123	1.4045	81.19	0.7120	16.9	91.0	107.9	0.0373	0.2289	21
22	46.26	37.94	0.0123	1.3772	81.08	0.7261	17.2	90.9	108.0	0.0379	0.2287	22
23	47.15	38.73	0.0124	1.3506	80.96	0.7404	17.4	90.7	108.1	0.0385	0.2286	23
24	48.06	39.52	0.0124	1.3247	80.85	0.7549	17.7	90.6	108.3	0.0391	0.2285	24
25	48.99	40.34	0.0124	1.2994	80.73	0.7696	18.0	90.4	108.4	0.0396	0.2283	25
26	49.92	41.16	0.0124	1.2747	80.62	0.7845	18.3	90.2	108.5	0.0402	0.2282	26
27	50.88	42.00	0.0124	1.2505	80.50	0.7997	18.6	90.1	108.7	0.0408	0.2280	27
28	51.84	42.85	0.0124	1.2268	80.39	0.8151	18.7	90.1	108.8	0.0411	0.2279	28
29	52.82	43.71	0.0125	1.2037	80.27	0.8308	19.0	89.9	108.9	0.0417	0.2277	29

Table 1 (continued)
Suva® MP66 Saturation Properties—Temperature Table

TEMP. °F	PRESSURE psia		VOLUME ft ³ /lb		DENSITY lb/ft ³		ENTHALPY Btu/lb			ENTROPY Btu/(lb)(°R)		TEMP. °F
	LIQUID P _f	VAPOR P _g	LIQUID v _f	VAPOR v _g	LIQUID 1/v _f	VAPOR 1/v _g	LIQUID h _f	LATENT h _{fg}	VAPOR h _g	LIQUID s _f	VAPOR s _g	
30	53.81	44.59	0.0125	1.1811	80.15	0.8467	19.3	89.7	109.0	0.0423	0.2276	30
31	54.82	45.48	0.0125	1.1590	80.04	0.8628	19.6	89.6	109.1	0.0428	0.2274	31
32	55.84	46.39	0.0125	1.1374	79.92	0.8792	19.9	89.4	109.3	0.0434	0.2273	32
33	56.88	47.31	0.0125	1.1162	79.81	0.8959	20.1	89.2	109.4	0.0440	0.2272	33
34	57.93	48.24	0.0125	1.0955	79.69	0.9128	20.4	89.1	109.5	0.0446	0.2270	34
35	59.00	49.19	0.0126	1.0754	79.57	0.9299	20.7	88.9	109.6	0.0451	0.2269	35
36	60.08	50.15	0.0126	1.0556	79.45	0.9473	21.0	88.8	109.8	0.0457	0.2268	36
37	61.17	51.13	0.0126	1.0364	79.34	0.9649	21.3	88.6	109.9	0.0463	0.2266	37
38	62.28	52.12	0.0126	1.0174	79.22	0.9829	21.6	88.4	110.0	0.0469	0.2265	38
39	63.41	53.12	0.0126	0.9990	79.10	1.0010	22.1	88.0	110.1	0.0479	0.2264	39
40	64.55	54.13	0.0127	0.9810	78.98	1.0194	22.4	87.9	110.3	0.0485	0.2262	40
41	65.71	55.16	0.0127	0.9634	78.87	1.0380	22.7	87.7	110.4	0.0490	0.2261	41
42	66.88	56.21	0.0127	0.9462	78.75	1.0569	23.0	87.5	110.5	0.0496	0.2260	42
43	68.06	57.27	0.0127	0.9293	78.63	1.0761	23.2	87.4	110.6	0.0502	0.2259	43
44	69.27	58.35	0.0127	0.9128	78.51	1.0955	23.5	87.2	110.7	0.0507	0.2257	44
45	70.49	59.44	0.0128	0.8966	78.39	1.1153	23.8	87.0	110.9	0.0513	0.2256	45
46	71.72	60.54	0.0128	0.8808	78.27	1.1353	24.1	86.9	111.0	0.0519	0.2255	46
47	72.97	61.67	0.0128	0.8654	78.15	1.1556	24.4	86.7	111.1	0.0524	0.2254	47
48	74.24	62.80	0.0128	0.8502	78.03	1.1762	24.7	86.5	111.2	0.0530	0.2252	48
49	75.52	63.96	0.0128	0.8354	77.91	1.1971	25.0	86.3	111.3	0.0536	0.2251	49
50	76.83	65.13	0.0129	0.8208	77.79	1.2183	25.3	86.2	111.5	0.0542	0.2250	50
51	78.14	66.32	0.0129	0.8066	77.67	1.2398	25.6	86.0	111.6	0.0547	0.2249	51
52	79.48	67.52	0.0129	0.7926	77.55	1.2616	25.9	85.8	111.7	0.0553	0.2248	52
53	80.83	68.74	0.0129	0.7790	77.43	1.2837	26.2	85.6	111.8	0.0559	0.2246	53
54	82.20	69.98	0.0129	0.7656	77.31	1.3062	26.5	85.5	111.9	0.0564	0.2245	54
55	83.59	71.23	0.0130	0.7525	77.19	1.3289	26.8	85.3	112.0	0.0570	0.2244	55
56	84.99	72.50	0.0130	0.7396	77.07	1.3520	27.1	85.1	112.2	0.0576	0.2243	56
57	86.42	73.79	0.0130	0.7271	76.95	1.3754	27.4	84.9	112.3	0.0581	0.2242	57
58	87.86	75.09	0.0130	0.7147	76.83	1.3991	27.7	84.7	112.4	0.0587	0.2241	58
59	89.31	76.42	0.0130	0.7027	76.70	1.4231	28.0	84.5	112.5	0.0593	0.2239	59
60	90.79	77.76	0.0131	0.6908	76.58	1.4475	28.3	84.4	112.6	0.0599	0.2238	60
61	92.29	79.12	0.0131	0.6792	76.46	1.4723	28.6	84.2	112.7	0.0604	0.2237	61
62	93.80	80.49	0.0131	0.6678	76.34	1.4974	28.9	84.0	112.8	0.0610	0.2236	62
63	95.33	81.89	0.0131	0.6567	76.21	1.5228	29.2	83.8	113.0	0.0616	0.2235	63
64	96.88	83.30	0.0131	0.6457	76.09	1.5486	29.5	83.6	113.1	0.0621	0.2234	64
65	98.45	84.73	0.0132	0.6350	75.97	1.5747	29.8	83.4	113.2	0.0627	0.2233	65
66	100.04	86.18	0.0132	0.6245	75.84	1.6012	30.1	83.2	113.3	0.0633	0.2232	66
67	101.65	87.65	0.0132	0.6142	75.72	1.6281	30.4	83.0	113.4	0.0639	0.2231	67
68	103.27	89.14	0.0132	0.6041	75.59	1.6553	30.7	82.8	113.5	0.0644	0.2230	68
69	104.92	90.65	0.0133	0.5942	75.47	1.6830	31.0	82.6	113.6	0.0650	0.2228	69
70	106.59	92.17	0.0133	0.5845	75.35	1.7110	31.3	82.4	113.7	0.0656	0.2227	70
71	108.27	93.72	0.0133	0.5749	75.22	1.7393	31.6	82.2	113.8	0.0661	0.2226	71
72	109.98	95.28	0.0133	0.5656	75.10	1.7681	31.9	82.1	114.0	0.0667	0.2225	72
73	111.70	96.87	0.0133	0.5564	74.97	1.7973	32.2	81.8	114.1	0.0673	0.2224	73
74	113.45	98.47	0.0134	0.5474	74.84	1.8269	32.5	81.6	114.2	0.0679	0.2223	74
75	115.22	100.10	0.0134	0.5385	74.72	1.8569	32.8	81.4	114.3	0.0684	0.2222	75
76	117.00	101.75	0.0134	0.5299	74.59	1.8872	33.1	81.2	114.4	0.0690	0.2221	76
77	118.81	103.41	0.0134	0.5213	74.47	1.9181	33.5	81.0	114.5	0.0696	0.2220	77
78	120.64	105.10	0.0135	0.5130	74.34	1.9493	33.8	80.8	114.6	0.0701	0.2219	78
79	122.49	106.81	0.0135	0.5048	74.21	1.9809	34.1	80.6	114.7	0.0707	0.2218	79
80	124.36	108.53	0.0135	0.4968	74.09	2.0130	34.4	80.4	114.8	0.0713	0.2217	80
81	126.25	110.28	0.0135	0.4889	73.96	2.0456	34.7	80.2	114.9	0.0719	0.2216	81
82	128.16	112.05	0.0135	0.4811	73.83	2.0785	35.0	80.0	115.0	0.0724	0.2215	82
83	130.10	113.85	0.0136	0.4735	73.70	2.1120	35.3	79.8	115.1	0.0730	0.2214	83
84	132.05	115.66	0.0136	0.4660	73.58	2.1458	35.7	79.6	115.2	0.0736	0.2213	84
85	134.03	117.50	0.0136	0.4587	73.45	2.1802	36.0	79.3	115.3	0.0742	0.2212	85
86	136.03	119.35	0.0136	0.4515	73.32	2.2150	36.3	79.1	115.4	0.0747	0.2211	86
87	138.05	121.23	0.0137	0.4444	73.19	2.2503	36.6	78.9	115.5	0.0753	0.2210	87
88	140.10	123.14	0.0137	0.4374	73.06	2.2860	36.9	78.7	115.6	0.0759	0.2209	88
89	142.16	125.06	0.0137	0.4306	72.93	2.3223	37.3	78.5	115.7	0.0765	0.2208	89

Table 1 (continued)
Suva® MP66 Saturation Properties—Temperature Table

TEMP. °F	PRESSURE psia		VOLUME ft ³ /lb		DENSITY lb/ft ³		ENTHALPY Btu/lb			ENTROPY Btu/(lb)(°R)		TEMP. °F
	LIQUID P _f	VAPOR P _g	LIQUID v _f	VAPOR v _g	LIQUID 1/v _f	VAPOR 1/v _g	LIQUID h _f	LATENT h _{fg}	VAPOR h _g	LIQUID s _f	VAPOR s _g	
90	144.25	127.01	0.0137	0.4239	72.80	2.3590	37.6	78.2	115.8	0.0770	0.2207	90
91	146.37	128.98	0.0138	0.4173	72.67	2.3963	37.9	78.0	115.9	0.0776	0.2206	91
92	148.50	130.97	0.0138	0.4108	72.54	2.4340	38.2	77.8	116.0	0.0782	0.2205	92
93	150.66	132.99	0.0138	0.4045	72.41	2.4723	38.5	77.6	116.1	0.0788	0.2204	93
94	152.84	135.03	0.0138	0.3982	72.28	2.5111	38.9	77.3	116.2	0.0794	0.2203	94
95	155.05	137.09	0.0139	0.3921	72.15	2.5504	39.2	77.1	116.3	0.0799	0.2202	95
96	157.27	139.18	0.0139	0.3861	72.02	2.5903	39.5	76.9	116.4	0.0805	0.2201	96
97	159.53	141.29	0.0139	0.3801	71.89	2.6306	39.9	76.6	116.5	0.0811	0.2200	97
98	161.80	143.42	0.0139	0.3743	71.76	2.6716	40.2	76.4	116.6	0.0817	0.2199	98
99	164.10	145.58	0.0140	0.3686	71.62	2.7131	40.5	76.2	116.7	0.0822	0.2198	99
100	166.43	147.77	0.0140	0.3630	71.49	2.7552	40.8	75.9	116.8	0.0828	0.2197	100
101	168.78	149.98	0.0140	0.3574	71.36	2.7978	41.2	75.7	116.9	0.0834	0.2195	101
102	171.15	152.21	0.0140	0.3520	71.23	2.8411	41.5	75.4	116.9	0.0840	0.2194	102
103	173.55	154.47	0.0141	0.3466	71.09	2.8849	41.8	75.2	117.0	0.0846	0.2193	103
104	175.97	156.75	0.0141	0.3414	70.96	2.9293	42.2	74.9	117.1	0.0852	0.2192	104
105	178.42	159.06	0.0141	0.3362	70.83	2.9743	42.5	74.7	117.2	0.0857	0.2191	105
106	180.89	161.40	0.0141	0.3311	70.69	3.0200	42.8	74.4	117.3	0.0863	0.2190	106
107	183.39	163.76	0.0142	0.3261	70.56	3.0663	43.2	74.2	117.4	0.0869	0.2189	107
108	185.91	166.15	0.0142	0.3212	70.42	3.1132	43.5	73.9	117.5	0.0875	0.2188	108
109	188.46	168.56	0.0142	0.3164	70.29	3.1607	43.9	73.7	117.5	0.0881	0.2187	109
110	191.03	171.00	0.0143	0.3116	70.15	3.2090	44.2	73.4	117.6	0.0887	0.2186	110
111	193.63	173.46	0.0143	0.3070	70.02	3.2578	44.5	73.2	117.7	0.0892	0.2185	111
112	196.26	175.96	0.0143	0.3024	69.88	3.3074	44.9	72.9	117.8	0.0898	0.2184	112
113	198.91	178.48	0.0143	0.2978	69.74	3.3577	45.2	72.6	117.9	0.0904	0.2183	113
114	201.59	181.02	0.0144	0.2934	69.61	3.4086	45.6	72.4	118.0	0.0910	0.2182	114
115	204.30	183.60	0.0144	0.2890	69.47	3.4603	45.9	72.1	118.0	0.0916	0.2181	115
116	207.03	186.20	0.0144	0.2847	69.33	3.5126	46.3	71.8	118.1	0.0922	0.2180	116
117	209.79	188.83	0.0145	0.2804	69.20	3.5657	46.6	71.6	118.2	0.0928	0.2179	117
118	212.58	191.48	0.0145	0.2763	69.06	3.6196	47.0	71.3	118.3	0.0934	0.2178	118
119	215.39	194.17	0.0145	0.2722	68.92	3.6742	47.3	71.0	118.3	0.0940	0.2177	119
120	218.23	196.88	0.0145	0.2681	68.78	3.7296	47.7	70.7	118.4	0.0946	0.2176	120
121	221.10	199.63	0.0146	0.2642	68.64	3.7857	48.0	70.5	118.5	0.0952	0.2175	121
122	224.00	202.40	0.0146	0.2602	68.50	3.8427	48.4	70.2	118.6	0.0958	0.2174	122
123	226.92	205.20	0.0146	0.2564	68.36	3.9004	48.7	69.9	118.6	0.0963	0.2173	123
124	229.87	208.03	0.0147	0.2526	68.22	3.9590	49.1	69.6	118.7	0.0969	0.2171	124
125	232.85	210.89	0.0147	0.2489	68.08	4.0184	49.4	69.3	118.8	0.0975	0.2170	125
126	235.86	213.77	0.0147	0.2452	67.94	4.0787	49.8	69.0	118.8	0.0981	0.2169	126
127	238.90	216.69	0.0147	0.2416	67.80	4.1398	50.2	68.7	118.9	0.0987	0.2168	127
128	241.97	219.64	0.0148	0.2380	67.66	4.2018	50.5	68.4	119.0	0.0993	0.2167	128
129	245.06	222.62	0.0148	0.2345	67.52	4.2647	50.9	68.1	119.0	0.0999	0.2166	129
130	248.18	225.63	0.0148	0.2310	67.38	4.3285	51.2	67.8	119.1	0.1005	0.2165	130
131	251.34	228.67	0.0149	0.2276	67.23	4.3932	51.6	67.5	119.2	0.1011	0.2164	131
132	254.52	231.74	0.0149	0.2243	67.09	4.4589	52.0	67.2	119.2	0.1018	0.2162	132
133	257.73	234.84	0.0149	0.2210	66.95	4.5255	52.3	66.9	119.3	0.1024	0.2161	133
134	260.97	237.97	0.0150	0.2177	66.81	4.5931	52.7	66.6	119.3	0.1030	0.2160	134
135	264.24	241.14	0.0150	0.2145	66.66	4.6617	53.1	66.3	119.4	0.1036	0.2159	135
136	267.54	244.33	0.0150	0.2114	66.52	4.7313	53.5	66.0	119.4	0.1042	0.2158	136
137	270.87	247.56	0.0151	0.2082	66.37	4.8020	53.8	65.7	119.5	0.1048	0.2157	137
138	274.23	250.82	0.0151	0.2052	66.23	4.8737	54.2	65.3	119.5	0.1054	0.2155	138
139	277.63	254.11	0.0151	0.2022	66.08	4.9464	54.6	65.0	119.6	0.1060	0.2154	139
140	281.05	257.44	0.0152	0.1992	65.93	5.0203	55.0	64.7	119.6	0.1066	0.2153	140
141	284.50	260.79	0.0152	0.1963	65.79	5.0953	55.3	64.3	119.7	0.1072	0.2152	141
142	287.99	264.19	0.0152	0.1934	65.64	5.1714	55.7	64.0	119.7	0.1079	0.2150	142
143	291.50	267.61	0.0153	0.1905	65.49	5.2487	56.1	63.7	119.8	0.1085	0.2149	143
144	295.05	271.07	0.0153	0.1877	65.35	5.3272	56.5	63.3	119.8	0.1091	0.2148	144
145	298.63	274.56	0.0153	0.1850	65.20	5.4068	56.9	63.0	119.9	0.1097	0.2146	145
146	302.24	278.08	0.0154	0.1822	65.05	5.4878	57.3	62.6	119.9	0.1103	0.2145	146
147	305.88	281.64	0.0154	0.1795	64.90	5.5699	57.7	62.3	120.0	0.1110	0.2144	147
148	309.55	285.24	0.0154	0.1769	64.75	5.6534	58.0	61.9	120.0	0.1116	0.2143	148
149	313.25	288.87	0.0155	0.1743	64.60	5.7382	58.4	61.6	120.0	0.1122	0.2141	149

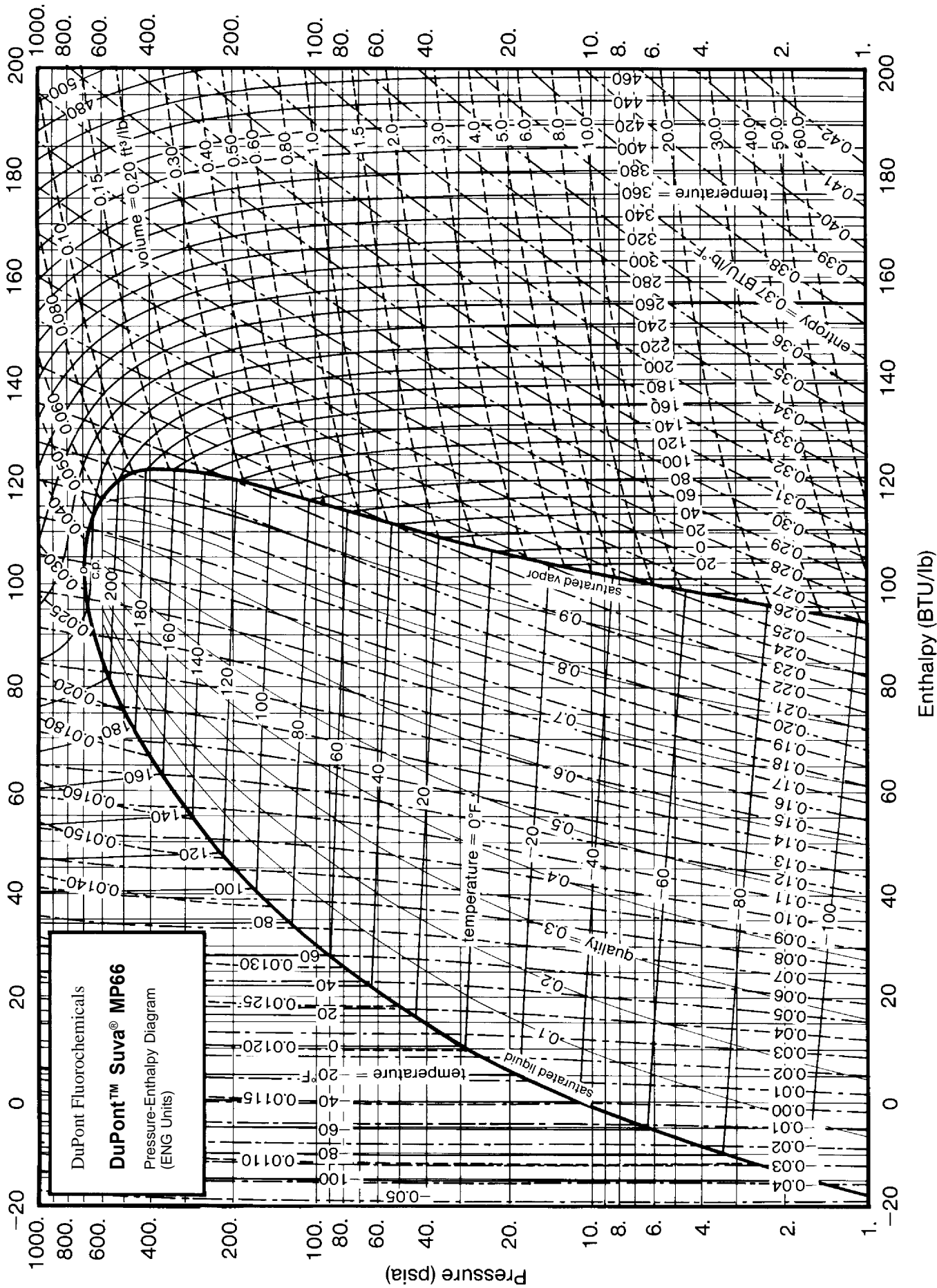
Table 1 (continued)
Suva® MP66 Saturation Properties—Temperature Table

TEMP. °F	PRESSURE psia		VOLUME ft ³ /lb		DENSITY lb/ft ³		ENTHALPY Btu/lb			ENTROPY Btu/(lb)(°R)		TEMP. °F
	LIQUID P _f	VAPOR P _g	LIQUID V _f	VAPOR V _g	LIQUID 1/V _f	VAPOR 1/V _g	LIQUID h _f	LATENT h _{fg}	VAPOR h _g	LIQUID S _f	VAPOR S _g	
150	316.99	292.53	0.0155	0.1717	64.45	5.8243	58.8	61.2	120.1	0.1129	0.2140	150
151	320.76	296.23	0.0156	0.1692	64.30	5.9118	59.2	60.9	120.1	0.1135	0.2138	151
152	324.56	299.97	0.0156	0.1666	64.15	6.0007	59.6	60.5	120.1	0.1141	0.2137	152
153	328.40	303.74	0.0156	0.1642	63.99	6.0910	60.0	60.1	120.1	0.1148	0.2136	153
154	332.27	307.54	0.0157	0.1617	63.84	6.1828	60.4	59.7	120.2	0.1154	0.2134	154
155	336.17	311.39	0.0157	0.1593	63.69	6.2761	60.8	59.4	120.2	0.1160	0.2133	155
156	340.10	315.27	0.0157	0.1570	63.53	6.3710	61.2	59.0	120.2	0.1167	0.2131	156
157	344.07	319.18	0.0158	0.1546	63.38	6.4674	61.7	58.6	120.2	0.1173	0.2130	157
158	348.07	323.13	0.0158	0.1523	63.23	6.5654	62.1	58.2	120.3	0.1180	0.2128	158
159	352.11	327.12	0.0159	0.1500	63.07	6.6651	62.5	57.8	120.3	0.1186	0.2127	159
160	356.17	331.15	0.0159	0.1478	62.91	6.7665	62.9	57.4	120.3	0.1193	0.2125	160
161	360.28	335.22	0.0159	0.1456	62.76	6.8697	63.3	57.0	120.3	0.1199	0.2124	161
162	364.41	339.32	0.0160	0.1434	62.60	6.9746	63.7	56.6	120.3	0.1206	0.2122	162
163	368.58	343.46	0.0160	0.1412	62.44	7.0813	64.2	56.2	120.3	0.1212	0.2120	163
164	372.79	347.64	0.0161	0.1391	62.28	7.1899	64.6	55.7	120.3	0.1219	0.2119	164
165	377.03	351.86	0.0161	0.1370	62.12	7.3005	65.0	55.3	120.3	0.1226	0.2117	165
166	381.30	356.12	0.0161	0.1349	61.96	7.4130	65.4	54.9	120.3	0.1232	0.2115	166
167	385.61	360.42	0.0162	0.1328	61.80	7.5275	65.9	54.5	120.3	0.1239	0.2114	167
168	389.96	364.76	0.0162	0.1308	61.64	7.6442	66.3	54.0	120.3	0.1246	0.2112	168
169	394.34	369.13	0.0163	0.1288	61.48	7.7630	66.7	53.6	120.3	0.1252	0.2110	169
170	398.75	373.55	0.0163	0.1268	61.32	7.8840	67.2	53.1	120.3	0.1259	0.2108	170
171	403.20	378.01	0.0164	0.1249	61.15	8.0073	67.6	52.7	120.3	0.1266	0.2106	171
172	407.69	382.51	0.0164	0.1230	60.99	8.1329	68.1	52.2	120.3	0.1273	0.2104	172
173	412.21	387.05	0.0164	0.1211	60.82	8.2610	68.5	51.7	120.3	0.1280	0.2103	173
174	416.77	391.63	0.0165	0.1192	60.66	8.3916	69.0	51.3	120.2	0.1287	0.2101	174
175	421.36	396.26	0.0165	0.1173	60.49	8.5247	69.4	50.8	120.2	0.1293	0.2099	175
176	425.99	400.92	0.0166	0.1155	60.32	8.6606	69.9	50.3	120.2	0.1300	0.2097	176
177	430.65	405.63	0.0166	0.1136	60.15	8.7991	70.4	49.8	120.2	0.1307	0.2095	177
178	435.36	410.39	0.0167	0.1119	59.98	8.9405	70.8	49.3	120.1	0.1315	0.2092	178
179	440.09	415.18	0.0167	0.1101	59.81	9.0849	71.3	48.8	120.1	0.1322	0.2090	179
180	444.87	420.02	0.0168	0.1083	59.64	9.2323	71.8	48.3	120.0	0.1329	0.2088	180
181	449.68	424.90	0.0168	0.1066	59.47	9.3828	72.2	47.8	120.0	0.1336	0.2086	181
182	454.53	429.83	0.0169	0.1049	59.29	9.5367	72.7	47.2	120.0	0.1343	0.2084	182
183	459.41	434.80	0.0169	0.1032	59.12	9.6939	73.2	46.7	119.9	0.1351	0.2081	183
184	464.33	439.82	0.0170	0.1015	58.94	9.8547	73.7	46.1	119.8	0.1358	0.2079	184
185	469.29	444.88	0.0170	0.0998	58.76	10.0191	74.2	45.6	119.8	0.1365	0.2076	185
186	474.29	449.99	0.0171	0.0982	58.58	10.1874	74.7	45.0	119.7	0.1373	0.2074	186
187	479.32	455.14	0.0171	0.0965	58.40	10.3596	75.2	44.4	119.6	0.1380	0.2071	187
188	484.39	460.34	0.0172	0.0949	58.22	10.5360	75.7	43.8	119.6	0.1388	0.2069	188
189	489.50	465.59	0.0172	0.0933	58.04	10.7167	76.2	43.3	119.5	0.1395	0.2066	189
190	494.64	470.88	0.0173	0.0917	57.85	10.9020	76.7	42.6	119.4	0.1403	0.2063	190
191	499.82	476.22	0.0173	0.0902	57.66	11.0920	77.3	42.0	119.3	0.1411	0.2061	191
192	505.04	481.62	0.0174	0.0886	57.48	11.2870	77.8	41.4	119.2	0.1419	0.2058	192
193	510.30	487.06	0.0175	0.0871	57.28	11.4873	78.3	40.8	119.1	0.1427	0.2055	193
194	515.59	492.55	0.0175	0.0855	57.09	11.6930	78.9	40.1	119.0	0.1435	0.2052	194
195	520.92	498.08	0.0176	0.0840	56.90	11.9045	79.4	39.4	118.9	0.1443	0.2049	195
196	526.29	503.68	0.0176	0.0825	56.70	12.1221	80.0	38.7	118.7	0.1451	0.2045	196
197	531.69	509.32	0.0177	0.0810	56.50	12.3462	80.6	38.0	118.6	0.1459	0.2042	197
198	537.14	515.01	0.0178	0.0795	56.30	12.5771	81.1	37.3	118.5	0.1468	0.2039	198
199	542.61	520.75	0.0178	0.0780	56.09	12.8153	81.7	36.6	118.3	0.1476	0.2035	199
200	548.13	526.55	0.0179	0.0766	55.89	13.0612	82.3	35.9	118.2	0.1485	0.2031	200
201	553.68	532.41	0.0180	0.0751	55.68	13.3154	82.9	35.1	118.0	0.1494	0.2028	201
202	559.26	538.31	0.0180	0.0736	55.46	13.5784	83.5	34.3	117.8	0.1503	0.2024	202
203	564.89	544.28	0.0181	0.0722	55.24	13.8509	84.1	33.5	117.6	0.1512	0.2020	203
204	570.54	550.30	0.0182	0.0708	55.02	14.1337	84.8	32.6	117.4	0.1521	0.2015	204
205	576.24	556.37	0.0183	0.0693	54.79	14.4275	85.4	31.8	117.2	0.1530	0.2011	205
206	581.96	562.51	0.0183	0.0679	54.56	14.7333	86.1	30.9	117.0	0.1540	0.2006	206
207	587.72	568.70	0.0184	0.0664	54.32	15.0522	86.8	30.0	116.7	0.1550	0.2002	207

Table 2 (continued)
Suva® MP66 Superheated Vapor—Constant Pressure Tables

V = Volume in ft³/lb H = Enthalpy in Btu/lb S = Entropy in Btu/(lb) (°R) (Saturation Properties in parentheses)

ABSOLUTE PRESSURE, psia													
TEMP. °F	400.00			450.00			500.00			550.00			TEMP. °F
	(175.80°F)			(186.00°F)			(195.34°F)			(203.95°F)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.1158)	(120.2)	(0.2097)	(0.0982)	(119.7)	(0.2074)	(0.0835)	(118.8)	(0.2047)	(0.0708)	(117.4)	(0.2016)	
180	0.1190	121.4	0.2116	—	—	—	—	—	—	—	—	—	180
190	0.1260	124.3	0.2160	0.1013	121.1	0.2095	—	—	—	—	—	—	190
200	0.1324	127.0	0.2201	0.1085	124.2	0.2142	0.0875	120.7	0.2075	—	—	—	200
210	0.1384	129.6	0.2241	0.1148	127.1	0.2186	0.0948	124.1	0.2128	0.0766	120.3	0.2059	210
220	0.1440	132.1	0.2278	0.1206	129.9	0.2227	0.1011	127.3	0.2174	0.0841	124.2	0.2116	220
230	0.1494	134.6	0.2315	0.1260	132.5	0.2266	0.1067	130.2	0.2217	0.0903	127.6	0.2166	230
240	0.1546	137.1	0.2350	0.1311	135.1	0.2304	0.1119	133.0	0.2258	0.0958	130.7	0.2211	240
250	0.1595	139.5	0.2385	0.1359	137.7	0.2340	0.1168	135.8	0.2296	0.1008	133.7	0.2253	250
260	0.1643	141.9	0.2419	0.1406	140.2	0.2376	0.1214	138.4	0.2334	0.1054	136.5	0.2292	260
270	0.1690	144.3	0.2452	0.1451	142.7	0.2410	0.1257	141.0	0.2370	0.1098	139.2	0.2330	270
280	0.1736	146.7	0.2484	0.1494	145.2	0.2444	0.1300	143.6	0.2405	0.1139	141.9	0.2367	280
290	0.1780	149.1	0.2516	0.1536	147.7	0.2477	0.1340	146.1	0.2439	0.1179	144.6	0.2402	290
300	0.1824	151.5	0.2548	0.1578	150.1	0.2509	0.1380	148.7	0.2472	0.1217	147.2	0.2437	300
310	0.1867	153.9	0.2579	0.1618	152.5	0.2541	0.1418	151.2	0.2505	0.1255	149.8	0.2471	310
320	0.1909	156.2	0.2610	0.1657	155.0	0.2572	0.1456	153.7	0.2537	0.1290	152.3	0.2504	320
330	0.1951	158.6	0.2640	0.1696	157.4	0.2603	0.1492	156.1	0.2569	0.1325	154.9	0.2536	330
340	0.1991	161.0	0.2670	0.1734	159.8	0.2634	0.1528	158.6	0.2600	0.1360	157.4	0.2568	340
350	0.2032	163.4	0.2699	0.1771	162.2	0.2664	0.1563	161.1	0.2631	0.1393	159.9	0.2599	350
360	0.2071	165.8	0.2729	0.1808	164.7	0.2694	0.1598	163.6	0.2661	0.1426	162.4	0.2630	360
370	0.2111	168.1	0.2758	0.1845	167.1	0.2723	0.1632	166.0	0.2691	0.1458	164.9	0.2660	370
380	0.2150	170.5	0.2786	0.1880	169.5	0.2752	0.1665	168.5	0.2720	0.1489	167.4	0.2690	380
390	0.2188	172.9	0.2815	0.1916	172.0	0.2781	0.1698	171.0	0.2750	0.1520	169.9	0.2720	390
400	0.2226	175.3	0.2843	0.1951	174.4	0.2809	0.1731	173.4	0.2778	0.1551	172.4	0.2749	400
410	0.2264	177.8	0.2871	0.1985	176.8	0.2838	0.1763	175.9	0.2807	0.1581	175.0	0.2778	410
420	0.2301	180.2	0.2899	0.2020	179.3	0.2866	0.1795	178.4	0.2835	0.1611	177.5	0.2807	420
430	0.2338	182.6	0.2926	0.2054	181.7	0.2893	0.1826	180.9	0.2863	0.1640	180.0	0.2835	430
440	0.2375	185.0	0.2953	0.2087	184.2	0.2921	0.1857	183.3	0.2891	0.1670	182.5	0.2864	440
450	0.2411	187.5	0.2980	0.2120	186.7	0.2948	0.1888	185.8	0.2919	0.1698	185.0	0.2891	450
460	0.2447	189.9	0.3007	0.2153	189.1	0.2975	0.1919	188.3	0.2946	0.1727	187.5	0.2919	460
470	0.2483	192.4	0.3034	0.2186	191.6	0.3002	0.1949	190.8	0.2973	0.1755	190.0	0.2946	470
480	0.2519	194.9	0.3060	0.2219	194.1	0.3029	0.1979	193.3	0.3000	0.1783	192.6	0.2973	480
490	—	—	—	0.2251	196.6	0.3055	0.2009	195.9	0.3027	0.1811	195.1	0.3000	490
500	—	—	—	—	—	—	0.2038	198.4	0.3053	0.1838	197.7	0.3027	500



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