

DEPARTMENT OF COMMERCE  
BUREAU OF STANDARDS  
WASHINGTON, D. C.

Letter  
Circular  
LC 114

(March 25, 1924)

(Abridged)

U. S. PETROLEUM OIL TABLE

Prepared by

The U. S. Bureau of Standards

VOLUME AT 60° F. OCCUPIED BY UNIT VOLUME AT INDICATED TEMPERATURE

This table shows the volume occupied at 60° F. by a quantity of oil of any commercial grade occupying unit volume at the indicated temperatures. For example, if a volume of commercial motor gasoline is measured at 105° F., 1 gallon measured at this temperature will occupy .9726 gallons at 60° F.

The values given in the body of the table are in the form of "Multipliers", that is, the volume of oil of a certain commercial grade at the indicated temperature multiplied by the corresponding factor in the table equals the volume at 60° F. For example, if a volume of 5600 gallons of commercial motor gasoline is measured at 105° F., the volume at 60° F. equals 5600 x .9726 or 5446.56 gallons.

This table can also be used to calculate the percentage change of volume to reduce to 60° F. The percentage factor is 100 times the difference between the tabulated value and unity. For example, in the case given above, the percentage factor is  $100(1.000 - 0.9726) = 2.74$ . That is, any volume of a commercial motor gasoline measured at 105° F. will decrease in volume by 2.74 percent on being reduced to a temperature of 60° F. For observed temperatures below 60° F. the volume correction should be added to the measured volumes; for temperatures above 60° F. it should be subtracted.

This table is an abridgment of Table 2, Circular No. 154, Bureau of Standards, and is intended to cover the bulk of present commercial grades of oils. For any oils not adequately covered by the abridged table the complete table should be used.

The abridged table is based on the following assumed average values for the A. P. I. gravity of each group:

<u>Group</u>	<u>A. P. I.</u>
Fuel oils	16
Lubricating oils	26
Gas oils	32
Kerosene	43
Motor gasoline	58
Export "	62
High Test gasoline	70
Casing head gasoline	86



Observed tempera- ture in °F	Fuel Oils	Lubri- cating Oils	Gas Oils	Kero- sene	Motor gaso- line	Export gaso- line	High Test gaso- line	Casing head gaso- line
Volume at 60°F occupied by unit volume at indicated temperature								
0	1.0263	1.0249	1.0261	1.0294	1.0361	1.0378	1.0411	1.0476
1	1.0229	1.0245	1.0257	1.0289	1.0355	1.0372	1.0404	1.0468
2	1.0225	1.0241	1.0252	1.0284	1.0349	1.0366	1.0397	1.0460
3	1.0221	1.0236	1.0248	1.0280	1.0343	1.0359	1.0391	1.0453
4	1.0217	1.0232	1.0243	1.0275	1.0337	1.0353	1.0384	1.0445
5	1.0213	1.0228	1.0239	1.0270	1.0331	1.0347	1.0377	1.0437
6	1.0209	1.0224	1.0235	1.0265	1.0325	1.0341	1.0370	1.0429
7	1.0205	1.0220	1.0230	1.0260	1.0319	1.0335	1.0363	1.0421
8	1.0201	1.0215	1.0226	1.0255	1.0313	1.0328	1.0357	1.0414
9	1.0197	1.0211	1.0221	1.0250	1.0307	1.0322	1.0350	1.0406
10	1.0193	1.0207	1.0217	1.0245	1.0301	1.0316	1.0343	1.0398
11	1.0189	1.0203	1.0213	1.0240	1.0295	1.0310	1.0336	1.0390
12	1.0185	1.0199	1.0208	1.0235	1.0289	1.0304	1.0329	1.0382
13	1.0181	1.0194	1.0204	1.0231	1.0283	1.0297	1.0323	1.0375
14	1.0177	1.0190	1.0199	1.0226	1.0277	1.0291	1.0316	1.0367
15	1.0173	1.0186	1.0195	1.0221	1.0271	1.0285	1.0309	1.0359
16	1.0169	1.0182	1.0191	1.0216	1.0265	1.0279	1.0302	1.0351
17	1.0165	1.0178	1.0187	1.0211	1.0259	1.0272	1.0295	1.0343
18	1.0162	1.0173	1.0183	1.0206	1.0253	1.0266	1.0289	1.0335
19	1.0158	1.0169	1.0177	1.0201	1.0247	1.0259	1.0282	1.0327
20	1.0154	1.0165	1.0173	1.0196	1.0241	1.0253	1.0275	1.0319
21	1.0150	1.0161	1.0169	1.0191	1.0235	1.0247	1.0268	1.0311
22	1.0146	1.0157	1.0165	1.0186	1.0229	1.0241	1.0261	1.0303
23	1.0143	1.0152	1.0160	1.0182	1.0223	1.0234	1.0255	1.0296
24	1.0139	1.0148	1.0156	1.0177	1.0217	1.0228	1.0248	1.0288
25	1.0135	1.0144	1.0152	1.0172	1.0211	1.0222	1.0241	1.0280
26	1.0131	1.0140	1.0148	1.0167	1.0205	1.0216	1.0234	1.0272
27	1.0127	1.0136	1.0143	1.0162	1.0199	1.0209	1.0227	1.0264
28	1.0124	1.0132	1.0139	1.0157	1.0193	1.0203	1.0221	1.0256
29	1.0120	1.0128	1.0134	1.0152	1.0187	1.0196	1.0214	1.0248
30	1.0116	1.0124	1.0130	1.0147	1.0181	1.0190	1.0207	1.0240
31	1.0112	1.0120	1.0126	1.0142	1.0175	1.0184	1.0200	1.0232
32	1.0108	1.0116	1.0121	1.0137	1.0169	1.0178	1.0193	1.0224
33	1.0104	1.0111	1.0117	1.0133	1.0163	1.0171	1.0186	1.0216
34	1.0100	1.0107	1.0112	1.0128	1.0157	1.0165	1.0179	1.0208
35	1.0096	1.0103	1.0108	1.0123	1.0151	1.0159	1.0172	1.0200
36	1.0092	1.0099	1.0104	1.0118	1.0145	1.0153	1.0165	1.0192
37	1.0088	1.0095	1.0100	1.0113	1.0139	1.0146	1.0158	1.0184
38	1.0085	1.0091	1.0095	1.0108	1.0133	1.0140	1.0152	1.0176
39	1.0081	1.0087	1.0091	1.0103	1.0127	1.0133	1.0145	1.0168
40	1.0077	1.0083	1.0087	1.0098	1.0121	1.0127	1.0138	1.0160
41	1.0073	1.0079	1.0083	1.0093	1.0115	1.0121	1.0131	1.0152
42	1.0069	1.0075	1.0078	1.0088	1.0109	1.0114	1.0124	1.0144
43	1.0065	1.0070	1.0074	1.0084	1.0103	1.0108	1.0118	1.0136
44	1.0061	1.0066	1.0069	1.0079	1.0097	1.0101	1.0111	1.0128
45	1.0057	1.0062	1.0065	1.0074	1.0091	1.0095	1.0104	1.0120
46	1.0053	1.0058	1.0061	1.0069	1.0085	1.0089	1.0097	1.0112
47	1.0049	1.0054	1.0056	1.0064	1.0079	1.0083	1.0090	1.0104
48	1.0046	1.0049	1.0052	1.0059	1.0072	1.0076	1.0083	1.0096
49	1.0042	1.0045	1.0047	1.0054	1.0066	1.0070	1.0076	1.0088
50	1.0038	1.0041	1.0043	1.0049	1.0060	1.0064	1.0069	1.0080
51	1.0034	1.0037	1.0039	1.0044	1.0054	1.0058	1.0062	1.0072
52	1.0030	1.0033	1.0035	1.0039	1.0048	1.0051	1.0055	1.0064
53	1.0027	1.0028	1.0030	1.0035	1.0042	1.0045	1.0049	1.0056
54	1.0023	1.0024	1.0026	1.0030	1.0036	1.0038	1.0042	1.0048
55	1.0019	1.0020	1.0022	1.0025	1.0030	1.0032	1.0035	1.0040
56	1.0015	1.0015	1.0018	1.0020	1.0024	1.0026	1.0028	1.0032
57	1.0011	1.0012	1.0013	1.0015	1.0018	1.0019	1.0021	1.0024
58	1.0008	1.0008	1.0009	1.0010	1.0012	1.0013	1.0014	1.0016
59	1.0004	1.0004	1.0004	1.0005	1.0006	1.0006	1.0007	1.0008
60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
61	0.9996	0.9996	0.9996	0.9995	0.9994	0.9994	0.9993	0.9992
62	.9992	.9992	.9991	.9990	.9988	.9987	.9986	.9984
63	.9988	.9988	.9987	.9985	.9982	.9981	.9979	.9976
64	.9985	.9984	.9982	.9980	.9976	.9974	.9972	.9968



Observed tempera- ture in °F	Fuel Oils	Lubri- cating Oils	Gas Oils	Kero- sene	Motor gaso- line	Export gaso- line	High Test gaso- line	Casing head gaso- line
Volume at 60°F occupied by unit volume at indicated temperature								
65	0.9981	0.9980	0.9978	0.9975	0.9970	0.9968	0.9965	0.9960
66	.9977	.9976	.9974	.9970	.9964	.9962	.9958	.9952
67	.9973	.9972	.9970	.9965	.9957	.9955	.9951	.9944
68	.9970	.9967	.9965	.9961	.9951	.9949	.9945	.9935
69	.9966	.9963	.9961	.9956	.9945	.9942	.9938	.9927
70	.9962	.9959	.9957	.9951	.9939	.9936	.9931	.9919
71	.9958	.9955	.9953	.9946	.9933	.9930	.9924	.9911
72	.9954	.9951	.9949	.9941	.9927	.9923	.9917	.9903
73	.9951	.9947	.9944	.9936	.9921	.9917	.9910	.9895
74	.9947	.9943	.9940	.9931	.9915	.9910	.9903	.9887
75	.9943	.9939	.9936	.9926	.9909	.9904	.9896	.9879
76	.9939	.9935	.9932	.9921	.9903	.9898	.9889	.9871
77	.9935	.9931	.9927	.9916	.9897	.9892	.9882	.9863
78	.9932	.9926	.9923	.9912	.9891	.9885	.9875	.9854
79	.9928	.9922	.9918	.9907	.9885	.9879	.9868	.9846
80	.9924	.9918	.9914	.9902	.9879	.9873	.9861	.9838
81	.9920	.9914	.9910	.9897	.9873	.9867	.9854	.9830
82	.9916	.9910	.9905	.9892	.9867	.9860	.9847	.9822
83	.9913	.9906	.9901	.9887	.9860	.9854	.9840	.9814
84	.9909	.9902	.9896	.9882	.9854	.9847	.9833	.9806
85	.9905	.9898	.9892	.9877	.9848	.9841	.9826	.9798
86	.9901	.9894	.9888	.9872	.9842	.9835	.9819	.9790
87	.9897	.9890	.9883	.9867	.9836	.9828	.9812	.9782
88	.9894	.9885	.9879	.9863	.9830	.9822	.9806	.9773
89	.9890	.9881	.9874	.9858	.9824	.9815	.9799	.9765
90	.9886	.9877	.9870	.9853	.9818	.9809	.9792	.9757
91	.9882	.9873	.9866	.9848	.9812	.9803		
92	.9878	.9869	.9862	.9843	.9806	.9796		
93	.9875	.9865	.9857	.9838	.9800	.9790		
94	.9871	.9861	.9853	.9833	.9794	.9783		
95	.9867	.9857	.9849	.9828	.9788	.9777		
96	.9863	.9853	.9845	.9822	.9782	.9771		
97	.9860	.9849	.9841	.9818	.9776	.9764		
98	.9856	.9845	.9836	.9814	.9769	.9758		
99	.9853	.9841	.9832	.9809	.9763	.9751		
100	.9849	.9837	.9828	.9804	.9757	.9745		
101	.9845	.9833	.9824	.9799	.9751	.9739		
102	.9841	.9829	.9819	.9794	.9745	.9732		
103	.9838	.9824	.9815	.9789	.9738	.9726		
104	.9834	.9820	.9810	.9784	.9732	.9719		
105	.9830	.9816	.9806	.9779	.9726	.9713		
106	.9826	.9812	.9802	.9774	.9720	.9707		
107	.9823	.9808	.9797	.9769	.9714	.9700		
108	.9819	.9804	.9793	.9765	.9708	.9694		
109	.9816	.9800	.9788	.9760	.9702	.9687		
110	.9812	.9796	.9784	.9755	.9696	.9681		
111	.9808	.9792	.9780	.9750	.9690	.9675		
112	.9804	.9788	.9776	.9745	.9684	.9668		
113	.9800	.9784	.9771	.9740	.9678	.9662		
114	.9796	.9780	.9767	.9735	.9672	.9655		
115	.9792	.9776	.9763	.9730	.9666	.9649		
116	.9788	.9772	.9759	.9725	.9660	.9643		
117	.9785	.9768	.9755	.9720	.9654	.9636		
118	.9781	.9764	.9750	.9716	.9647	.9630		
119	.9778	.9760	.9746	.9711	.9641	.9623		
120	.9774	.9756	.9742	.9706	.9635	.9617		
121	.9770	.9752	.9738	.9701	.9629	.9611		
122	.9766	.9748	.9733	.9696	.9623	.9604		
123	.9763	.9744	.9729	.9691	.9617	.9598		
124	.9759	.9740	.9724	.9686	.9611	.9591		
125	.9755	.9736	.9720	.9681	.9605	.9585		
126	.9751	.9732	.9716	.9676				
127	.9748	.9728	.9712	.9671				
128	.9744	.9723	.9707	.9667				
129	.9741	.9719	.9703	.9662				



Observed tempera- ture in °F	Fuel Oils	Lubri- cating Oils	Gas Oils	Kero- sene
---------------------------------------	--------------	--------------------------	-------------	---------------

Volume at 60°F occupied by unit volume at indicated temperature

130	0.9737	0.9715	0.9699	0.9657
131	.9733	.9711	.9695	.9652
132	.9730	.9707	.9690	.9647
133	.9726	.9704	.9686	.9642
134	.9723	.9700	.9681	.9637
135	.9719	.9696	.9677	.9632
136	.9715	.9692	.9673	.9627
137	.9712	.9688	.9669	.9622
138	.9708	.9684	.9665	.9618
139	.9705	.9680	.9661	.9613
140	.9701	.9676	.9657	.9608
141	.9697	.9672	.9653	.9603
142	.9693	.9668	.9648	.9598
143	.9690	.9664	.9644	.9593
144	.9686	.9660	.9639	.9588
145	.9682	.9656	.9635	.9583
146	.9678	.9652	.9631	.9578
147	.9674	.9648	.9627	.9573
148	.9671	.9644	.9622	.9569
149	.9667	.9639	.9618	.9564
150	.9663	.9635	.9614	.9559
151	.9659	.9631	.9610	
152	.9656	.9627	.9605	
153	.9652	.9624	.9601	
154	.9649	.9620	.9596	
155	.9645	.9616	.9592	
156	.9641	.9612	.9589	
157	.9638	.9608	.9584	
158	.9634	.9604	.9579	
159	.9631	.9600	.9575	
160	.9627	.9596	.9571	
161	.9623	.9592	.9567	
162	.9620	.9588	.9563	
163	.9616	.9584	.9558	
164	.9613	.9580	.9554	
165	.9609	.9576	.9550	
166	.9605	.9572	.9546	
167	.9602	.9568	.9542	
168	.9598	.9564	.9537	
169	.9595	.9560	.9533	
170	.9591	.9556	.9529	
171	.9587	.9552	.9525	
172	.9584	.9548	.9520	
173	.9580	.9544	.9516	
174	.9577	.9540	.9511	
175	.9573	.9536	.9507	
176	.9569	.9532	.9503	
177	.9565	.9528	.9499	
178	.9562	.9524	.9494	
179	.9558	.9520	.9490	
180	.9554	.9516	.9486	
181	.9551	.9512	.9482	
182	.9547	.9508	.9478	
183	.9544	.9505	.9474	
184	.9540	.9501	.9470	
185	.9537	.9497	.9466	
186	.9533	.9493	.9462	
187	.9530	.9489	.9457	
188	.9526	.9485	.9453	
189	.9523	.9481	.9448	
190	.9519	.9477	.9444	
191	.9515	.9473	.9440	
192	.9512	.9469	.9436	
193	.9508	.9465	.9431	
194	.9505	.9461	.9427	
195	.9501	.9457	.9423	

1000	1000	1000	1000	1000
2000	2000	2000	2000	2000

1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

1000	1000	1000	1000	1000
2000	2000	2000	2000	2000
3000	3000	3000	3000	3000
4000	4000	4000	4000	4000
5000	5000	5000	5000	5000

6000	6000	6000	6000	6000
7000	7000	7000	7000	7000
8000	8000	8000	8000	8000
9000	9000	9000	9000	9000
10000	10000	10000	10000	10000

11000	11000	11000	11000	11000
12000	12000	12000	12000	12000
13000	13000	13000	13000	13000
14000	14000	14000	14000	14000
15000	15000	15000	15000	15000

16000	16000	16000	16000	16000
17000	17000	17000	17000	17000
18000	18000	18000	18000	18000
19000	19000	19000	19000	19000
20000	20000	20000	20000	20000

21000	21000	21000	21000	21000
22000	22000	22000	22000	22000
23000	23000	23000	23000	23000
24000	24000	24000	24000	24000
25000	25000	25000	25000	25000

26000	26000	26000	26000	26000
27000	27000	27000	27000	27000
28000	28000	28000	28000	28000
29000	29000	29000	29000	29000
30000	30000	30000	30000	30000

31000	31000	31000	31000	31000
32000	32000	32000	32000	32000
33000	33000	33000	33000	33000
34000	34000	34000	34000	34000
35000	35000	35000	35000	35000

36000	36000	36000	36000	36000
37000	37000	37000	37000	37000
38000	38000	38000	38000	38000
39000	39000	39000	39000	39000
40000	40000	40000	40000	40000

41000	41000	41000	41000	41000
42000	42000	42000	42000	42000
43000	43000	43000	43000	43000
44000	44000	44000	44000	44000
45000	45000	45000	45000	45000