

DEPARTMENT OF COMMERCE  
BUREAU OF STANDARDS  
WASHINGTON

Letter  
Circular  
LC 159

(February 18, 1925)

ABRIDGED VOLUME CORRECTION TABLE FOR PETROLEUM OILS

(For complete table, see Table 2, Circular 154)

Information Section  
Bureau of Standards, Washington

The table contained herein has been prepared to meet a demand from the oil industry for a short and convenient table for reducing oil volumes to the basis of 60° F. when extreme accuracy is not required. It is not intended to replace the more complete and accurate volume correction table contained in Circular No. 154, but rather to supplement it and especially to replace the various abridged tables and approximate correction factors heretofore employed in the oil industry.

In case of disagreement between buyer and seller, or whenever high accuracy is essential the complete table contained in Circular No. 154 should be used, especially if large volumes or wide temperature ranges are involved.

The abridged table is based on the same data as Table 2, Circular No. 154. The groups, coefficients of expansion, degrees A. P. I., and gravity range of the abridged table follow:

Group Number	Coefficient of Expansion at 60°F.	Range of Group (Degrees A.P.I. at 60°F.)	Mean of Group Degrees A.P.I.
I	0.0004	10 to 34.9	23
II	.0005	35 to 50.9	43
III	.0006	51 to 63.9	57
IV	.0007	64 to 78.9	71
V	.0008	79 to 88.9	84
VI	.00085	89 and higher	91

Note: The tabulated multipliers for each group are those corresponding to the integral degree A.P.I. nearest to the mean of that group. They are in agreement with the corresponding values given in Table 2, Circular No. 154.

This table shows the volume occupied at 60° F. by a quantity of oil occupying unit volume at the indicated temperature. For example, if at 60° F. the A.P.I. gravity of the oil is 28, (Group I), one gallon of this oil measured at 120° F. will have a volume of 0.9763 gallons at 60° F. The values given in the table are in the form of "Multipliers"; that is, the volume of oil at the indicated temperature and degrees A.P.I. for each group, multiplied by the corresponding factor in the table, equals the volume at 60° F. For example, if the A.P.I. gravity of an oil at 60° F. equals 28 (Group I) and the volume at 120° F. equals 6000 gallons, then the volume at 60° F. equals 6000 × 0.9763, or 5857.8 gallons.

1914

1914

1914

1914

1914

1914

1914

1914

1914

1914

1914

1914

1914

1914

1914

1914

1914

1914

Observed tempera- ture in ° F.	Group					LC 159
	I	II	III	IV	V	VI
	Degrees A. P. I. at 60° F.					
	10.0 to 34.9	35.0 to 50.9	51.0 to 63.9	64.0 to 78.9	79.0 to 88.9	89.0 and higher
	Volume at 60° F. Occupied by Unit Volume at Indicated Temperature.					
0	1.0242	1.0294	1.0356	1.0415	1.0467	1.0501
1	1.0238	1.0289	1.0350	1.0408	1.0459	1.0493
2	1.0234	1.0284	1.0344	1.0401	1.0452	1.0484
3	1.0230	1.0280	1.0339	1.0394	1.0444	1.0476
4	1.0226	1.0275	1.0333	1.0387	1.0437	1.0467
5	1.0222	1.0270	1.0327	1.0380	1.0429	1.0459
6	1.0218	1.0265	1.0321	1.0373	1.0421	1.0451
7	1.0214	1.0260	1.0315	1.0366	1.0413	1.0443
8	1.0210	1.0255	1.0309	1.0360	1.0406	1.0434
9	1.0206	1.0250	1.0303	1.0353	1.0398	1.0426
10	1.0202	1.0245	1.0297	1.0346	1.0390	1.0418
11	1.0198	1.0240	1.0291	1.0339	1.0382	1.0410
12	1.0194	1.0235	1.0285	1.0332	1.0375	1.0402
13	1.0189	1.0231	1.0280	1.0326	1.0367	1.0393
14	1.0185	1.0226	1.0274	1.0319	1.0360	1.0385
15	1.0181	1.0221	1.0268	1.0312	1.0352	1.0377
16	1.0177	1.0216	1.0262	1.0305	1.0344	1.0369
17	1.0173	1.0211	1.0256	1.0298	1.0336	1.0360
18	1.0169	1.0206	1.0250	1.0291	1.0329	1.0352
19	1.0165	1.0201	1.0244	1.0284	1.0321	1.0343
20	1.0161	1.0196	1.0238	1.0277	1.0313	1.0335
21	1.0157	1.0191	1.0232	1.0270	1.0305	1.0327
22	1.0153	1.0186	1.0226	1.0263	1.0297	1.0319
23	1.0148	1.0182	1.0220	1.0257	1.0290	1.0310
24	1.0144	1.0177	1.0214	1.0250	1.0282	1.0302
25	1.0140	1.0172	1.0208	1.0243	1.0274	1.0294
26	1.0136	1.0167	1.0202	1.0236	1.0266	1.0286
27	1.0132	1.0162	1.0196	1.0229	1.0258	1.0277
28	1.0128	1.0157	1.0191	1.0223	1.0251	1.0269
29	1.0124	1.0152	1.0185	1.0216	1.0243	1.0260
30	1.0120	1.0147	1.0179	1.0209	1.0235	1.0252
31	1.0116	1.0142	1.0173	1.0202	1.0227	1.0244
32	1.0112	1.0137	1.0167	1.0195	1.0219	1.0236
33	1.0108	1.0133	1.0161	1.0188	1.0212	1.0227
34	1.0104	1.0128	1.0155	1.0181	1.0204	1.0219
35	1.0100	1.0123	1.0149	1.0174	1.0196	1.0211
36	1.0096	1.0118	1.0143	1.0167	1.0188	1.0203
37	1.0092	1.0113	1.0137	1.0160	1.0180	1.0194
38	1.0088	1.0108	1.0131	1.0153	1.0173	1.0186
39	1.0084	1.0103	1.0125	1.0146	1.0165	1.0177
40	1.0080	1.0098	1.0119	1.0139	1.0157	1.0169
41	1.0076	1.0093	1.0113	1.0132	1.0149	1.0160
42	1.0072	1.0088	1.0107	1.0125	1.0141	1.0152
43	1.0068	1.0084	1.0102	1.0119	1.0134	1.0143
44	1.0064	1.0079	1.0096	1.0112	1.0126	1.0135
45	1.0060	1.0074	1.0090	1.0105	1.0118	1.0126
46	1.0056	1.0069	1.0084	1.0098	1.0110	1.0118
47	1.0052	1.0064	1.0078	1.0091	1.0102	1.0110
48	1.0048	1.0059	1.0071	1.0083	1.0095	1.0101
49	1.0044	1.0054	1.0065	1.0076	1.0087	1.0093
50	1.0040	1.0049	1.0059	1.0069	1.0079	1.0084
51	1.0036	1.0044	1.0053	1.0062	1.0071	1.0076
52	1.0032	1.0039	1.0047	1.0055	1.0063	1.0067
53	1.0028	1.0035	1.0042	1.0049	1.0056	1.0059
54	1.0024	1.0030	1.0036	1.0042	1.0048	1.0050
55	1.0020	1.0025	1.0030	1.0035	1.0040	1.0042
56	1.0016	1.0020	1.0024	1.0028	1.0032	1.0034
57	1.0012	1.0015	1.0018	1.0021	1.0024	1.0025
58	1.0008	1.0010	1.0012	1.0014	1.0016	1.0017
59	1.0004	1.0005	1.0006	1.0007	1.0008	1.0008
60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
61	.9996	.9995	.9994	.9993	.9992	.9992
62	.9992	.9990	.9988	.9986	.9984	.9983
63	.9988	.9985	.9983	.9979	.9977	.9975
64	.9984	.9980	.9977	.9972	.9969	.9966





Observed tempera- ture in ° F.	Group						Observed tempera- ture in ° F.	LC 159		
	I	II	III	IV	V	VI		I	II	
	Degrees A.P.I. at 60° F.							Degrees A.P.I. at 60° F.		
	10.0	35.0	51.0	64.0	79.0	89.0	10.0	35.0	60° F.	
	to	to	to	to	to	and	to	to		
	34.9	50.9	63.9	78.9	88.9	higher	34.9	50.9		
	Volume at 60° F. Occupied by Unit Volume at						Indicated Temperature.			
65	0.9980	0.9975	0.9971	0.9965	0.9961	0.9958	130	0.9724	0.9657	
66	.9976	.9970	.9965	.9958	.9953	.9949	131	.9720	.9652	
67	.9972	.9965	.9958	.9951	.9945	.9941	132	.9716	.9647	
68	.9968	.9961	.9952	.9944	.9937	.9932	133	.9713	.9642	
69	.9964	.9956	.9946	.9937	.9929	.9924	134	.9709	.9637	
70	.9960	.9951	.9940	.9930	.9921	.9915	135	.9705	.9632	
71	.9956	.9946	.9934	.9923	.9913	.9907	136	.9701	.9627	
72	.9952	.9941	.9928	.9916	.9905	.9898	137	.9697	.9622	
73	.9948	.9936	.9922	.9909	.9897	.9890	138	.9694	.9618	
74	.9944	.9931	.9916	.9902	.9889	.9881	139	.9690	.9613	
75	.9940	.9926	.9910	.9895	.9881	.9873	140	.9686	.9608	
76	.9936	.9921	.9904	.9888	.9873	.9864	141	.9682	.9603	
77	.9932	.9916	.9898	.9881	.9865	.9856	142	.9678	.9598	
78	.9929	.9912	.9893	.9874	.9857	.9847	143	.9675	.9593	
79	.9925	.9907	.9887	.9867	.9849	.9839	144	.9671	.9588	
80	.9921	.9902	.9881	.9860	.9841	.9830	145	.9667	.9583	
81	.9917	.9897	.9875	.9853	.9833	.9821	146	.9663	.9578	
82	.9913	.9892	.9869	.9846	.9825	.9813	147	.9659	.9573	
83	.9909	.9887	.9862	.9839	.9818	.9804	148	.9655	.9569	
84	.9905	.9882	.9856	.9832	.9810	.9796	149	.9651	.9564	
85	.9901	.9877	.9850	.9825	.9802	.9787	150	.9647	.9559	
86	.9897	.9872	.9844	.9818	.9794	.9779	151	.9643		
87	.9893	.9867	.9838	.9811	.9786	.9770	152	.9639		
88	.9889	.9863	.9832	.9804	.9778	.9762	153	.9636		
89	.9885	.9858	.9826	.9797	.9770	.9753	154	.9632		
90	.9881	.9853	.9820	.9790	.9762	.9745	155	.9628		
91	.9877	.9848	.9814				156	.9624		
92	.9873	.9843	.9808				157	.9620		
93	.9869	.9838	.9803				158	.9616		
94	.9865	.9833	.9797				159	.9612		
95	.9861	.9828	.9791				160	.9608		
96	.9857	.9823	.9785				161	.9604		
97	.9853	.9818	.9779				162	.9601		
98	.9849	.9814	.9772				163	.9597		
99	.9845	.9809	.9765				164	.9594		
100	.9841	.9804	.9760				165	.9590		
101	.9837	.9799	.9754				166	.9586		
102	.9833	.9794	.9748				167	.9582		
103	.9830	.9789	.9742				168	.9578		
104	.9826	.9784	.9736				169	.9574		
105	.9822	.9779	.9730				170	.9570		
106	.9818	.9774	.9724				171	.9566		
107	.9814	.9769	.9718				172	.9562		
108	.9811	.9765	.9712				173	.9559		
109	.9807	.9760	.9706				174	.9555		
110	.9803	.9755	.9700				175	.9551		
111	.9799	.9750	.9694				176	.9547		
112	.9795	.9745	.9688				177	.9543		
113	.9791	.9740	.9682				178	.9540		
114	.9787	.9735	.9676				179	.9536		
115	.9783	.9730	.9670				180	.9532		
116	.9778	.9725	.9664				181	.9528		
117	.9775	.9720	.9658				182	.9524		
118	.9771	.9716	.9652				183	.9521		
119	.9767	.9711	.9646				184	.9517		
120	.9763	.9706	.9640				185	.9513		
121	.9759	.9701	.9634				186	.9509		
122	.9755	.9696	.9628				187	.9505		
123	.9752	.9691	.9622				188	.9502		
124	.9748	.9686	.9616				189	.9498		
125	.9744	.9681	.9610				190	.9494		
126	.9740	.9676					191	.9490		
127	.9736	.9671					192	.9487		
128	.9732	.9667					193	.9483		
129	.9728	.9662					194	.9480		
							195	.9476		

